

Ray.

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HOW CATARACT PATIENTS' EYES ARE DRESSED
AT THE PRESBYTERIAN EYE, EAR, AND
THROAT CHARITY HOSPITAL, OF
BALTIMORE.

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IN the manual for cataract operations there is now but little difference exhibited in the work of experienced ophthalmic surgeons. Clean instruments are deemed essential by all. For several years I have sterilized them by immersion in boiling water for five minutes at least before using them. After using they are always washed in hot water before being put away. This method seems perfect, and leaves nothing to be desired. When I enter the operating room the first act of the nurse is to light the gas under the hot water kettle. I have been in the habit of washing the entire conjunctival surface with sublimated water 1 to 4,000, using an eye irrigator throwing a single stream with some force. I have often doubted whether this washing subserves any good purpose. In such healthy eyes as operated upon I do not believe that there are any pathogenic germs to be washed away. If such microbes were on the conjunctiva, I equally do not think that the use of the forcible stream could dislodge them; nor do I believe that the momentary application of the sublimate solution would destroy them. The wiping of the everted lid-surfaces with a piece of cotton wetted with the sublimate water can only be for the mental relief of the operator. It belongs to the list of "horseshoe over the door" remedies which should have no place in enlight-

ened surgery. I have seen skilful surgeons going seriously through this performance as if the subservient microbes only promenaded upon the smooth surfaces of the tarsus, and therefore there was no need to seek them in the deep recesses of the conjunctival fornix.

All extractions I perform under cocaine, in the operating room of the hospital, on an operating table placed conveniently before large windows. The simple extraction without an iridectomy has been for several years the rule of the hospital, and with rare exceptions has been most satisfactory. Iritic hernias will now and then occur, even in cases which promised the best results for the first few days after the operation. While I have never lost an eye from this accident, the cutting off of the protrusion retards the healing, and makes the convalescence much more protracted. When these prolapses occur, which is in about eight per cent of my simple extractions, I have a secret admonition that a primary iridectomy would have been the better operation, even if the eye did not look as beautiful after it. In my experience, hernias appear with great irregularity, and can be traced to no recognized cause. Extracting cataracts, as I do very frequently, sometimes I do not see an iritic protrusion for months, until I even begin to think that a larger experience and greater manual dexterity has at last eliminated this accident from my list of surgical troubles. Then one, two, or even more prolapses will occur in a comparatively short period, in proof that I am to be no more successful than my colleagues in eye work. While a lost eye from cataract operation is now among the rarest of accidents, with or without iridectomy, I sometimes believe that on the whole, the iridectomy will insure the speedier convalescence. This conclusion I have come to after operating upon upwards of 500 without, and over 1,500 with iridectomy. Were I called upon to operate on a case to be afterwards treated by the family physician, I feel that I could leave the patient more safely in such unskilled hands by making an iridectomy; because the too early inspection of the eye through innate curiosity could then do no harm. After an iridectomy under such circumstances, a permanent dressing of isinglass plaster would be applied which should not be removed for five days, and after which no further dressing would be required.

The corneal wound I always make large so as to allow of the easy escape of the lens. Transfixion of the cornea is made near its equator, the height of the flap depending upon the consistency of the lens substance, and the size of its nucleus. All lens substance is removed by corneal pressure. Washing out the anterior

chamber I have abandoned as a needless and somewhat dangerous innovation. The iris usually resumes its normal position without help. Should the pupil be irregular in outline, by means of a shell spatula the iris is smoothed out from the corners of the corneal wound where it seems to have been caught.

With my present method of extracting without iridectomy I have had to abandon the adhesive strap dressing. In iridectomy cases the ready healing of the corneal wound could be so surely relied upon, that it was not necessary to inspect the eyeball until it was ready for release from further dressing, on the fifth day after the operation. Under such a condition, the transparent, soft isinglass strip made the most perfect of dressings. If properly applied, it stuck to the lids closely and surely. The single application would keep the lids well stuck together for as many days as were necessary. It made no injurious pressure; it made the lids support perfectly the corneal wound; the dressing could not become deranged; its translucency enabled the surgeon to inspect daily the lids and detect any secretion without molesting the dressing. Every indication for treatment was met by this perfect eye band. When extracting senile cataracts without iridectomy became the established operation of the hospital, the fear of iritic hernia made a daily inspection of the eyeball necessary. It was found that the isinglass strip was not the most convenient dressing when a daily renewal was required, and therefore the single Lebright eye bandage was adopted. It is a quadrangular piece of folded muslin, three inches long by two inches wide, with long tapes extending from each corner for securing it to the head. Over the closed eye is placed first a square of felted absorbent cotton, known as the "cottonoid surgical dressing." This is usually wetted with the weak sublimate solution, more as a sterilized water to soften the felt, than an antiseptic application. A very thin wad of cotton wool is placed over this and the whole secured by the single-eye bandage, lightly tied on the opposite temple so as to exercise no pressure on the eyeball. I do not bake any of this material. I find it a safe application without being especially sterilized.

As is well known, I have for many years applied the dressings only to the eye operated upon, leaving the other eye untrammelled, and therefore for use by the patient. As soon as I was thoroughly convinced by numerous and carefully conducted contrasting experiments, that an equally good per cent of perfect results could be obtained whether both eyes were bandaged or only one of them, I gave my patients the benefit of my discovery, with the comforts

and privileges belonging to it. I learned to my absolute satisfaction that the leaving open of the eye that was still useful did not increase the dangers of complications. My experience in several hundreds of cataract extractions, with final results which compare favorably with a similar series of operations by those who are accustomed to pursue the most rigid course of bodily restraint, fully sustains me in the liberty of movements which I allow my cataract patients. When the dressings have been applied the patient gets down from the operating table. If he has sight enough in the exposed eye he walks to his room, from which the sunlight has been shut out by a dark blue shade, which does not make, however, the room gloomy. The patient can see to walk about, to feed himself, is allowed to dress himself, and to attend to his general wants without calling constantly for the nurse. When this liberty is known to be not injurious, patients consider them great privileges when contrasted with the dependent condition of being blindfolded and confined to bed. The eye is inspected daily, the light of the room being quite sufficient for this purpose. By the third day the wound is found healed and then an atropia drop is instilled. On the fifth day the bandage is permanently removed. Slowly the eye becomes accustomed to the light, so that by the fourteenth day after the operation it can stand exposure to ordinary daylight, and the patient is ready to leave the hospital.

In operating upon children, for soft or congenital cataracts, when I have made the pupil fully dilated by atropia, I make a free incision in the anterior capsule, quite long enough to allow some of the lens substance to protrude into the aqueous. I apply no dressings to the eye for closing it up, I find it much more advantageous to apply the bandage to the little patient's hands, for one day at least, to prevent them from rubbing the eyes. Atropia is used three times a day to ensure complete dilation of the pupil. The little wrist-band, passing from one arm to the other behind the back, and permitting, as it does, of many movements, does not in any way fret the child. In the meantime, the eye is safe from injury, with child, nurse, and parents happy. When the eyes are bandaged and the child, as usual, restless, the dressings secured to its round head will frequently become disarranged; and a sleepless child, a wornout nurse, and an anxious mother greet the surgeon on the morrow of the operation. I have had great satisfaction in needling soft cataracts since I abandoned the tying up of the eye operated upon.

DESTRUCTION OF THE EYE BY HEMORRHAGE
FOLLOWING CATARACT EXTRACTION.¹

BY EDWARD JACKSON, A. M., M. D.,

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MRS. F., age 75, applied at the eye clinic of the Philadelphia Polyclinic, May 20, 1891. Her sight had been failing for more than a year and she gave a history of headache. She was a large, fleshy woman, in fair general health. She brought into the hospital with her a mixture containing morphia, which she had previously been taking.

In the right eye a diffused haze of the deeper media prevented a clear view of the fundus. There appeared to be a broad shallow cup, the disc was dark gray, the edge of the cup somewhat uncertain as to whether it extended quite to the edge of the disc, which was surrounded by a halo of choroidal atrophy.

The left eye presented a dislocated lens, densely hazy, so that only a faint fundus reflex was visible. It was dislocated downward; its edges appearing at the upper margin of the pupil when dilated to six millimeters.

Vision, Right, $\frac{1}{100}$. Left, light perception, and a fair projection throughout the field. There was a chronic catarrhal conjunctivitis, which was treated with applications of silver nitrate, and the case kept under observation for a few days.

May 25. The dislocated lens was removed from the left eye by simple extraction without the use of the wire-loop, or of any fixation of the lens. Simple extraction was preferred, because it was believed that by avoiding the upward extension of the pupil, the lens could be expelled without loss of vitreous, and this was accomplished. The pupil became circular, central, and moderately contracted without any vitreous presenting in the wound. The eyes were then closed and bandaged and the patient left lying upon the operating table. One-half hour later I was called to see her.

A few minutes after the completion of the dressing, she began to complain of pain in the temple and back of the head, which increased, became extremely severe, and forced her to move about in seeking to ease it. When I reached her the dressing was already soaked through with blood. Upon removing it a clot, the size of a small walnut, was found between the lid attached to which were noticed remains of vitreous. Dark blood was escaping from the corneal wound rapidly.

The recollection of the teaching of the late D. Hayes Agnew that position was the first step in the checking of hemorrhage came to me as the

¹Read before the Section on Ophthalmology of the College of Physicians of Philadelphia.

only practical method of meeting the emergency; and I at once placed the patient upright, with the feet hanging at the side of the table. Almost immediately the bleeding ceased; the pain gradually lessened, and, cutting away so much of the clot as lay outside of the gaping corneal wound, the eye was again dressed under some pressure.

There was no continuance or recurrence of the bleeding. The patient complained from time to time of severe pain, which has continued until the present time, as has her refusal to permit the enucleation of the eye for its relief. With the shrinkage of the clot, the lips of the corneal wound gradually came together. The eye was kept cleansed with a solution of mercuric chloride 1:5000, and atropine used twice daily.

June 6. The anterior chamber was re-established and the patient was permitted to leave the hospital. There was now general hyperemia of the globe, a mild inflammation without general suppuration. The eye continued to shrink irregularly and to be the seat of considerable pain, which the patient is probably disposed to exaggerate.

In the *right eye*, the notes show that by November, 1891, there was a deep cup extending the full width of the disc. The fundus was dim, apparently from haziness of vitreous.

In January, 1892, the disc and larger vessels were barely distinguishable through this haze. There had been no increase in the opacity of the lens and there was no marked limitation of the visual field.

In October, 1892, the fundus was still more hazy; vision reduced to counting fingers at eight feet. In August, 1893, the eye was substantially the same. Vision, counting fingers at four feet. At no time has hemorrhage been observed in the fundus of the right eye.

The practical point in this case which impressed me most strongly was the prompt checking of hemorrhage by position, and the obvious deduction that in a case of this kind it would be better to operate with the patient sitting up, and to keep the patient with the head raised for sometime after the operation. I have followed this plan in three cases where the patients were women of large frame and quite fleshy. On one of these patients I had done iridectomy for glaucoma some years before. She had passed from under my care and in the interval suffered absolute glaucoma in the second eye. These patients did well and the corneal wound exhibited prompt and normal healing.

The clinical history of this patient, extending now more than two years after the operation, seems to favor the belief that hemorrhage after cataract extraction is closely allied to a tendency to glaucoma. And, perhaps, the operation, the result of which was so immediately disastrous, has been of value to the patient by preventing any attempt to operate upon the remaining eye and thus preserving some useful vision for the period that has since elapsed.

In discussion of the above case, Dr. Charles Hermon Thomas said: "A case of hemorrhage during cataract operation occurred in

my hands many years ago, and very early in my practice, (1867) it being the second case on which I had been called upon to operate.

"The hemorrhage, which occurred immediately after the corneal incision and before any attempt at the removal of the lens, and, if I mistake not, before iridectomy was begun, was extremely severe. The blood gushed over the face and flooded the pillow. There was little or no complaint of pain. A firm compress, filling the orbit was applied and pressure made by a tight bandage. The hemorrhage then ceased and did not again return. The patient made a good recovery; but, of course, with a totally ruined eyeball. She was a woman in apparently good health, about 60 years of age, and of spare habit.

"At that time I had never heard of the occurrence of such an accident, and the moral shock to the operator was consequently scarcely less than to the patient and her friends, great as it was to them."

Dr. Wm. Thomson also reported a case of similar character.

A CASE OF INTRA-OCULAR HEMORRHAGE AFTER
EXTRACTION OF CATARACT.¹By G. E. DE SCHWEINITZ, M. D.
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AGNES DONOVAN, aged 65, was admitted to the Ophthalmic wards of the Philadelphia Hospital, June 23, 1892. Her right eye was sightless and shrunken, the result of an injury inflicted many years ago. In the left eye there was a dense nuclear opacity in the crystalline lens, the surrounding portions of this structure being clear and transmitting the red reflex from the fundus oculi. Vision equalled counting fingers. The eyeball was prominent, of the type usually seen in myopic refraction; the anterior chamber deep; the conjunctiva slightly congested, and the anterior perforating vessels more tortuous than is normal.

She was not seen again until nearly one year later, May 15, 1893, when the appearances already described remained unchanged. The general health of the patient was good; there was neither albumin nor sugar in the urine; but the temporal arteries were hard and the pulse characteristic of high arterial tension. On the 17th of the same month preliminary iridectomy was performed—a perfectly smooth operation—and the capsule of the lens stroked with a spatula. There was no complication in the healing.

One month later, June 26, 1893, the entire lens was opaque; the eye was quiet, having, to use Mr. Carter's apt expression, entirely "forgotten the iridectomy;" the iris was mobile, and, so far as loupe examination showed, not atrophic, the light projection perfect, and the tension normal. Extraction was performed by the 3-millimeter flap operation, the knife being entered exactly at the corneo-scleral junction, at the outer extremity of a horizontal line which would pass 3 millimeters below the summit of the cornea. Immediately at the completion of the section, and before the cystotome was used, a bead of vitreous presented in the wound, the crystalline lens being tipped somewhat upward. The cataract was quickly, but with some difficulty, removed with a scoop, its exit being followed by a quick gush of vitreous. For an appreciable length of time there was slight diminution in the tension of the eyeball, followed quickly by a restoration of the tension to the extent of an unusual filling out of the ball. The flap fell nicely into place, the margins of the coloboma were clear, the vitreous ceased to escape and fingers could be counted. The usual light antiseptic dressing was applied, and the patient who had been operated upon in the bed in which she was to remain, was moved to a darkened corner of the ward.

¹Read before the Section on Ophthalmology of the College of Physicians of Philadelphia.

She complained almost at once of a sickening pain in the back of the head and of nausea. Suspecting that I was in the presence of the gravest of all accidents which may occur after cataract extraction, a hypodermic injection of morphia, $\frac{1}{4}$ of a grain was administered, and the patient's head was raised above the horizontal level to the height of three pillows piled one above the other. In ten minutes, blood began to ooze through the bandages. The dressings were quickly removed and the palpebral fissure found distended with a large blood-clot, while fluid blood flowed freely down the cheek. Remembering the advice of Knapp, the blood-clots were carefully removed, one from its position between the lids and another which protruded through the corneal incision. The conjunctival cul-de-sac, the wound and the surrounding area were carefully cleansed with a solution of bichloride of mercury, 1:5,000, and a full, firm antiseptic dressing was applied. The patient was required to sit bolt upright in the bed, properly supported with pillows. After another $\frac{1}{4}$ of a grain of morphia was administered, the sickening pain in the back of the head disappeared, and she expressed herself as feeling comfortable.

Two hours later I was hastily summoned by the house surgeon with the statement that the bleeding had recommenced. Precisely the same treatment which has been detailed was carried out, although no additional morphia was administered until later in the night, when some return of pain caused the resident surgeon to repeat the dose. At the expiration of twenty-four hours the bandages were removed, and, with the exception of a little hemorrhage-staining on the pad next the eye, there had been no renewal of hemorrhage. The cornea was perfectly clear; a blood-clot (which was removed), separated the lips of the wound and partly filled the remains of the anterior chamber; and there was distinct light perception to the lower and outer part of the field.

The subsequent history of this case may be dismissed in a few words: The hemorrhage did not recur, and panophthalmitis did not supervene. Gradually the eyeball has somewhat shrunken, although it still preserves its form, being puckered around the corneal margins. The cornea remains clear, although prominent and small in area, somewhat resembling a pellucid staphyloma, but the faint light perception which lasted for about forty-eight hours, has entirely disappeared and the eye is totally blind.

This, with one exception, is the usual history of these cases, the exception being, to quote the words of Knapp in describing a similar case, that "the dreaded suppuration did not occur." This may be credited to the careful antisepsis which was instituted at once, and which was pursued at each subsequent dressing. The practical deduction, however, is, as has already been pointed out by Knapp, that the advice, at one time prevalent, immediately to enucleate an eye under these circumstances, should not be followed. For example, Trousseau,² reporting the results of 234 cataract extractions, details the loss of one eye from intra-ocular

² Bulletin de la Clinique Nationale Ophthalmologique de la Hospice des Quinze-Vingts, 1892.

hemorrhage beginning five or six hours after the operation. The next day the coagula were removed and the eye dressed antiseptically, and although it atrophied and became sightless, it was satisfactory in appearance.

The hemorrhage, in my case, evidently came from the posterior portion of the eye, and, no doubt, as in other examples, depended upon senile changes in the blood vessels. Ripening the cataract by direct trituration and the necessity of scoop extraction were probably factors of importance in causing this accident, but they alone could not have been responsible in an eye not otherwise predisposed to such an occurrence.

Galezowski,³ describing the advantages of simple extraction, gives a table of 1,934 cases in which he has performed the semi-elliptical section for the extraction of cataract without iridectomy, states that this method never gives rise to hemorrhage, whether in cases of arthritic, gouty or diabetic patients. Intra-ocular hemorrhage, according to him, is to be explained by division of atheromatous vessels in the iris near its ciliary ligament, and hence this accident is not at all to be dreaded in simple extraction, or with sphincterotomy. Inasmuch as we know that vitreous hemorrhage has occurred in simple extraction, and, as in my own case, although there had been] an iridectomy, it was a preliminary one and there was no wounding of the vessels of the iris in the section, the proper preventive treatment of intra-ocular hemorrhage after cataract extraction evidently does not alone reside in performing extraction by the uncombined method.

The treatment has been detailed, and the good results, so far as preventing suppuration, have been described. Whether or not—after the premonitory symptoms of intra-ocular hemorrhage have occurred, for example, the pushing forward of a bead of vitreous into the wound, the sudden increase in the tension of the eyeball, the sickening pain in the back of the head, the nausea, and, as in Knapp's case, the vomiting,—actual bleeding can be prevented or checked is very doubtful. Of one thing I am assured—that a hypodermic injection of morphia is indicated,⁴ and I believe, as Jackson has suggested, that the position of the patient is not without effect. While I do not for a moment suppose that anything short of a miracle would have prevented the hemorrhage in the case which I have reported, I regret that I did not place the patient bolt upright at once and not wait until I actually saw the

³ *Recueil d'Ophthalmologie*, May, 1893,

⁴ Bates suggests full doses of bromide of potash.

blood staining the bandages. Under these circumstances, a hypodermic injection of ergotin has been tried. From the standpoint of the physiological action of drugs it would seem to be a proper therapeutic procedure.

It is hard to obtain an adequate idea of the liability of this accident in cataract extraction as compared with other causes of failure. Thus, Galezowski,⁵ reporting nearly 2,000 cases, has never met a single instance. Knapp, writing in 1890, says: "I have never seen a case, either in my own practice, or in that of anybody. I consider this as a lucky chance, for, according to the usual course of events, I may have two cases next month." What he apprehended, occurred, in part at least, very soon afterward.

⁵ Loc. cit.

DESTRUCTIVE HEMORRHAGE DURING EXTRACTION OF CATARACT.¹

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CATHERINE MALLEY, aged 82. A tall, angular Irish woman, with deep-set eyes, apparently in vigorous health, presented herself for treatment at the Wills Hospital, May 20, 1892.

She had been blind, according to her own statement, for two years. The urine was free from albumin and sugar. Both irides were tremulous and did not react to change of light. The right pupil was slightly larger than the left, and cocaine produced but slight dilation in either. Both lenses were cataractous, and at first appeared to be partially dislocated downwards. More careful study revealed over-ripe cataracts, and numerous glistening, cholesterine-like crystals in the substance of the lens. These were more numerous in the right eye. The apparent displacement was also greater on the right side, but in both eyes seemed due to a sagging downward of the lenticular mass, made possible by a relaxation, rather than a rupture of the suspensory ligament. The lenses had undergone partial liquefaction, affording, in fact, an example of the Morgagnian cataract. A gray-red reflex could be had from the fundus through the upper part of the pupils. Light projection was good, in all parts of the field, and light perception normal.

Operation for extraction, May 23, 1892. The patient's head and shoulders were elevated by extra pillows, as she complained that she could not breathe lying flat with a small pillow only, under her head. A perfectly smooth and satisfactory incision, rather smaller than for ordinary simple extraction was made upward in the clear cornea. For a moment after completing the incision the pupil remained circular, but before capsulotomy could be attempted, the patient cried out from sudden and violent pain in the eye and head, which was almost immediately followed by a large prolapse of the iris and a profuse gush of fluid vitreous. The speculum was removed and the upper lid elevated by the finger of an assistant. The wire loop was then introduced and the nucleus of the lens extracted without difficulty and without apparently increasing the loss of vitreous, which indeed was arrested for the time by the presence of the loop. The lids were then

¹Read before the Section on Ophthalmology of the College of Physicians of Philadelphia.

closed, but the violent pain remained and the vitreous continued to flow through the closed lids and was soon followed by a continuous stream of bright red blood. The hemorrhage was so free that the blood ran over the face and down to the pillows. Hot water was freely used, which in some measure, relieved the pain, but had no perceptible influence over the flow of blood. A compress bandage was then firmly applied, a hypodermic injection of morphia administered, and the patient allowed to rest for an hour.

When the compress was removed, the corneal wound was found gaping widely and filled with the prolapsed iris and a large dark blood-clot. Enucleation of the ball was advised after a consultation with Drs. Harlan and Oliver, but to this the patient would not submit. The blood-clot and prolapse of the iris were then excised and the compress bandage again applied. The following day the wound was closed with a pouting black mass, and the pupil filled with a dense blood-clot. There was no reaction and the pain had subsided. Two days later the patient insisted upon leaving the hospital against the remonstrance of her friends and the resident surgeons. Some time later I learned that she had died suddenly.

No particulars of her fatal illness were secured, therefore any statement regarding its cause would be merely surmise; unless we reason backward from the brittle condition of the intra-ocular blood vessels to the probability of like conditions existing in the intracranial circulation and death from apoplexy.

The liquified state of the cortical, the presence of the cholesterine crystals in the lens, the sagging downward of the lenticular mass, the tremulous irides, and, finally, the very fluid vitreous are all indications of the degenerative processes which had been going on in the eye prior to the opacification of the lens, and naturally led to an unfavorable prognosis before the operation, the correctness of which was only too sadly demonstrated by the unfortunate and painful sequel.

MONOCULAR POLYOPIA. TWO CASES.

BY OTTO LANDMAN, M. D.,
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THE fact that dissimilar causes might induce the same effect, is so common in our experiences of consequences, that we may assert as a conclusion, that all cases of monocular polyopia, of course excluding visible peripheral bulbar defects, are not due to one cause. It is impossible, in the midst of medical uncertainties, to make arbitrary and indisputable assertions.

Galezowski inclines to the opinion that the phenomenon of monocular diplopia has its "apparent seat within the eye," and is "certainly due to a spasm of accommodation producing a functional myopia and a secondary diplopia, and, moreover, possessing a hysterical character." Hence, if atropine or glasses be employed to counteract this myopia, the diplopia disappears.

Duret reported a case of monocular diplopia and believes that there was a disassociation of function between the two cerebral hemispheres. The phenomenon followed an injury to the head. One can readily produce a monocular diplopia by glasses placed in varying positions before the eye, and this phenomenon is probably due to an irregular astigmatism which it induces. From this we can understand how the ciliary muscle *might* affect the lens so as to produce two images; but yet, if the patient were sufficiently intelligent, you might elicit an admission that one of the two images was brighter than the other. As we see cases and draw our conclusion, the natural process will be to state the cases and then our deductions.

Case I. L. S., aged 11. History: Had been playing in bed on the morning of October 26, 1891, and falling out of it, struck upon the left side of her forehead. Thereupon she became delirious and continued in this state until Friday. She knew not what had happened. I examined her at her home and found diplopia, and on ophthalmoscopical examination, some anemia of both discs. November 2, convergent strabismus of R. E. Pupil normal, colors normal. R. E. counts fingers in one foot. Hm. + 0.50 Ds., $V=\frac{5}{16}$. Monocular diplopia, cycloplegia with + 3. Ds., Sn. 1.

L. E., $V=\frac{5}{16}$, Hm. + 0.50 Ds., $V=\frac{5}{16}$. Cycloplegia with + 2 Ds., Sn. 0.6 in three inches, contraction of both fields. Ophthalmoscopical appearance normal. Convergent strabismus R. E. Slight in L. E.

November 3, B. E. diplopia, fingers in five feet $+ 0.75$ Ds., $V = \frac{1}{8}$. R. E. fingers in eight feet, doubled, Hm. $+ 0.50$ Ds., $V = \frac{1}{8}$. With $+ 3$ Ds., Sn. .08 in three inches. L. E. diplopia, Hm. $+ 1$ Ds., $V = \frac{1}{8}$, with a $+ 2$ Ds., Sn. 1.25 in three inches. Ophthalmoscopic appearance, normal.
 November 7, R. E. monocular diplopia, Hm. $+ 0.5$ Ds., $V = \frac{1}{8}$. L. E. no diplopia, $\frac{1}{8}$. Hm. $+ 0.5$ Ds., $V = \frac{1}{8}$.

She had been put on alternatives—red iodide of mercury and potassium iodide. She eventually recovered.

Case II. H. H., aged 28. Consulted me January 18, 1893. On December 27, 1892, an electric car ran down his wagon, upsetting same and throwing him upon the pavement, along which he was dragged for a short distance by his horse. His ankle was sprained. When he reached home he was totally deaf. Did not notice squint until a few days after the accident.

R. E., $V = \frac{1}{8}$ $+ 1.50$ Ds., $\odot + 0.50$ D., cyl. ax. 180° $V = \frac{1}{2}$.

L. E., $V = \frac{1}{8}$. Jr. 1 in six inches, $+ 0.50$ D., cyl. ax. 180° $V = \frac{1}{2}$.

Pupils, fields, colors, and fundi, normal. Diagnosis, cerebral capillary hemorrhage. (Therapy: Potass. iodide and essence of pepsin.) Diplopia and monocular polyopia. Paresis external rectus of left eye.

January 23, sees five images in L. E.; one in R. E.

January 26, sees five images in L. E.; one in R. E.

January 29, sees three images in L. E.; one in R. E.

February 2, sees four images in L. E.; one in R. E.

February 6, right eye has some strabismus internus.

February 13, sees three images with L. E.; one with R. E.

Paresis external rectus of R. E.

February 19, entirely well. R. E., $\frac{1}{2}$, Hm. $+ 1.50$ Ds. L. E., $\frac{1}{8}$, $+ 0.5$ D. cyl. ax. 180° $V = \frac{1}{2}$. B. E. Jr. 1 in six inches.

The above cases are surely not cases of ciliary spasm and apparent myopia, and would not fall, in this respect at least, under Galezowski's category.

From the testimony of the patients it would seem that they did not notice the diplopia immediately after the accident, and yet it might have existed, but in their confusion they may have overlooked it. In both cases there was strabismus internus, and in one case, of both eyes, and monocular diplopia in each. In the other, monocular polyopia in the squinting eye. A careful perusal of obtainable authorities has brought only one fact to light which may serve to make clear and corroborate our idea. Of course, such slight lesions as we have suspected never come to a final determination through a post-mortem. My idea of the cases is that the difficulty was in the visual centers, due to a hemorrhage and clot, which was organized and finally absorbed. Secondly, that the center was subdivided by this act and that it comprehended two or more impressions from one image. The question is whether the physical continuity of a center may be destroyed, with or without destroying its psychical or physiological

power. The removal of a certain area in the posterior lobes produces total blindness; a portion, partial blindness. No particular part of the area need be removed, but a right or left, or superior or inferior piece may be plucked out, and partial blindness follow. The center acts as a whole if there be no break in its continuity.

If a particular area of the brain be stimulated, a certain group of muscles may be thrown into a definite action. If this area be separated by a deep circular incision from its adjacent tissues, and be stimulated, movements identical with the intact area after stimulation, will be evoked. And we may go still further, and can, by such a procedure, separate by a moat, as it were, a center within this center, which will act upon a single muscle out of this group. From this experiment we know that a center can be subdivided.

Defects in almost any portion of the retina may lead to defects in the visual field. "And we may further imagine it, at least, possible that mischief in the brain might be so limited as to produce any of the above partial effects, though the retina, optic nerve and optic tracts all remained intact." Does a center act indissolubly? Can we not conceive of a hemorrhage forming a line of separation and barrier preventing impulses from diffusing themselves; and, hence one center dividing itself into two or more? From the evidence mentioned, we are lead to believe that monocular diplopia may be the result of a lesion separating the visual center within itself and the peripheral impression being one and the central two or more.

ON SOME MODIFICATION OF MY ASTIGMOMETER,
AND ON ITS EFFICIENCY IN THE EXAMINA-
TION FOR ASTIGMATISM.

By F. C. HOTZ, M. D.

PROFESSOR OF OPHTHALMOLOGY, CHICAGO POLICLINIC.

AT the Nashville meeting of the American Medical Association, in May, 1890, I exhibited in the Ophthalmological Section an instrument with which we can easily detect the presence of astigmatism and quickly determine the direction of the principal meridians. The instrument consisted of a small round disc, having a small circular aperture in its center, and another one of the same size near the edge; this disc was attached to the front of a larger square sheet of metal in such a manner that it could revolve about its central aperture. Behind the round disc the metal of the screen was cut out so that when the instrument was placed in front of a window or a gaslight, both holes appeared as luminous points. Just over the peripheric hole, the edge of the rotary disc was drawn out to an arrow point, which, in the revolutions of the disc, traveled along a graduated semi-circle (protractor) and indicated the exact angle of the radius in which the peripheric hole was situated.

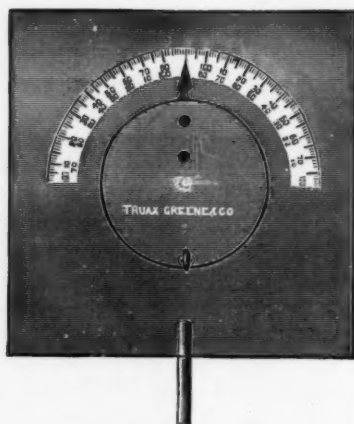
It is a well-known fact that to an astigmatic eye a distant point of light does not appear round, but seems drawn out in the direction of one of the principal meridians. If, therefore, a patient looking at the apertures in the instrument at a distance of fifteen to twenty feet, declares that they appear elongated, we know at once the eye is astigmatic, and we can also easily find the exact direction of the meridians. If the elongation is either vertical or horizontal we know the astigmatism is in the vertical or horizontal meridian. But if the holes appear drawn out in an oblique direction, we have only to rotate the peripheric hole until its long axis appears to the patient in the line of prolongation of the long axis of the central hole; and the degree to which the arrow points, gives us the exact angle of the oblique meridian.

Now, if we imagine a third aperture in the rotary disc situated between the central and peripheric holes, and exactly in the radius

connecting them, this third aperture would appear drawn out in the same direction as the other two, and when the long axes of the central and peripheric holes appear to be parts of a continuous line, the long axis of the intermediate aperture would certainly also lie in that line. But as two holes are sufficient for ascertaining the direction of the astigmatic meridian, I came to the conclusion that we can attain our purpose by the two eccentric holes and might dispense with the central aperture.

This modification offers several advantages. In the first place, it simplifies the construction of the instrument as it does away with the complicated mechanism necessary for revolving a disc on a central aperture.

Secondly, the edges of these eccentric holes can be made very



thin and sharp by beveling the metal on the posterior surface, while the front of the disc is left perfectly even and smooth.

And, thirdly, the two test holes can be placed so much nearer to each other that it becomes much easier for the patient to tell when their long axes are in line. In my improved instrument¹ the rotary disc has a radius of 3.5 cm., the holes have a diameter of 4 mm., and are 1 cm. apart, the outer one being 1 cm. from the edge of the disc. The centers of both holes are situated in the same radius, and at the peripheric end of this radius the edge of the disc is drawn out to a long point which moves over the graduated arc and registers, during the revolutions of the disc, the

¹ Made by Truax, Greene & Co., 75 Wabash avenue, Chicago.

exact position of the radius in which the test holes are situated. A piece of ground glass or mica is slipped over the holes at the posterior surface of the disc in order to diffuse the transmitted light evenly over the apertures and to bring out their contours sharply.

The astigmatic image of the light spots is not always a regular oval, but often it is described as a half-moon or diamond-shaped; or the patient sees a round spot from which a short line of light issues in a certain direction; and, sometimes, he sees each hole double instead of elongated, in which case the position of the secondary hole indicates the direction of the meridian.

In simple astigmatism, the astigmatic effect upon the holes is usually noticed by the unaided eye; but in a number of simple hypermetropic astigmatism of low degrees the elongation of the holes was more decidedly perceived with the convex glass which corrected the hypermetropia of the faulty meridian. In compound and mixed astigmatism the elongation is best brought out by that spherical lens which reduces the refraction of the eye to the condition of a simple astigmatism.

In my former communication I did not give any statistical proofs of the efficiency of this test, but contented myself with saying that I had tried this instrument eighteen years and could vouch for its reliability and practical utility. But such general statements do not give the necessary information to anyone who wishes to compare the relative merits of different instruments used for similar purposes. We can form a correct idea of the efficiency of the instrument only if we know the exact results of the examination in a given number of instances. To furnish these statistical data, my assistant, Dr. L. E. Schwarz, has collected for me from my private records the notes of the last 200 astigmatic eyes which have been tested by my astigmometer; and as it is of particular interest to know how many cases of astigmatism of low degrees there are among the 200, and how often the instrument has succeeded in their detection, Dr. Schwarz has prepared the following table:

DEGREE OF ASTIGMATISM.	Number of Eyes.	Number of Failures.	Percentage of Failures.
Astigmatism of 0.25.....	52	8	15.4
Astigmatism of 0.50.....	83	2	2.4
Astigmatism greater than 0.50.....	65	5	7.7
Total.....	200	15	7.5

This is certainly a very satisfactory result. An instrument which reveals to us the astigmatism in 92.5% of all cases, and detects the lowest grade in 84.6%, and the next lowest in 97.6%, must commend itself for its great practical usefulness.

It is particularly gratifying to learn that the instrument has shown itself so very reliable in detecting the astigmatism of 0.50 D., because this degree is probably the most frequent source of ocular headache and its prompt recognition, therefore, of the greatest practical importance. One of the two eyes of this group, in which our test failed, had a simple hyperopic astigmatism, but V. was $\frac{3}{8}$ only; the failure in this case was plainly due to the amblyopia; for in the other eye of the same patient with the same astigmatism, but V. $\frac{3}{8}$, the astigmatism was promptly revealed by the elongation of the apertures.

To the same cause (the low visual acuity), must be attributed the five failures in the sixty-five cases of higher grades of astigmatism. One eye with hyperopic astigmatism 3.50 D., had V $\frac{1}{10}$ only; in two eyes with M 7 D. V was improved by the addition of -1.50 c from $\frac{3}{8}$ to $\frac{3}{8}$; in one eye with mixed astigmatism (M. 2 and H. 1.50) V $\frac{3}{8}$; and in one eye with mixed astigmatism (M. 0.50; H. 3) V $\frac{3}{8}$. But in this last case, I believe, the failure could have been avoided; for to the other eye of the same patient (which was tested first), the apertures appeared horizontally elongated with -2 D. though its V. was also $\frac{3}{8}$ only; but its astigmatism was a mixture of M. 2.50 and H. 0.50; and assuming the astigmatism of the other eye to be of the same combination, I tested it for the apertures with -2 D. only, and, of course, failed. If I had repeated the test with weak concave glasses (-0.50 or -1), or with a $+2$, I should have probably succeeded. In all other cases of astigmatism, more than 0.50 D., where the visual acuity was $\frac{3}{8}$ or better, the astigmatism and its axis was promptly revealed by the astigmometer.

The high percentage of good results shows that this test does not put the powers of observation to a very severe task and that it succeeds with people (children and adults) having only a very modest degree of intelligence.

I find I can more safely rely on it in diagnosticating astigmatism than I can on the ophthalmoscope or shadow-test; and I have had no reason to abandon this simple instrument for a costly ophthalmometer. It is true the latter instrument gives us in a certain number of cases the correct degree of astigmatism, but it is equally true that in as many instances it does not give the amount cor-

rectly. Its findings, therefore, cannot be trusted and depended upon in prescribing the correcting lenses; it cannot fill the place of the trial box and test-types. Hence, in refraction work, the ophthalmometer is chiefly employed, (like my astigmometer), for the quick detection of astigmatism and the determination of the meridians; and the facts show that in this respect, my instrument is the more reliable of the two; for if my astigmometer reveals astigmatism in an eye, all other tests confirm the presence of astigmatism; but as the ophthalmometer measures only the corneal curvature, it often finds astigmatism in eyes shown by every other test to be emmetropic, and may find emmetropia in eyes shown by other tests to be astigmatic.

Wurde mann,² for instance, found among 177 astigmatic eyes, fourteen without corneal astigmatism; in these fourteen eyes, therefore, the astigmatism could not have been detected by the ophthalmometer. And Lautenbach, in a recent summary³ of his large experience with the ophthalmometer, says it gives the axis of astigmatism in 88%, while my astigmometer has shown its efficiency in the detection of astigmatism and its meridians in 92.5%. These figures surely offer no reason why I should abandon the well-tried old instrument.

Venetian Building.

²Transactions of the Ophthalmological Section of the American Medical Association, 1892.

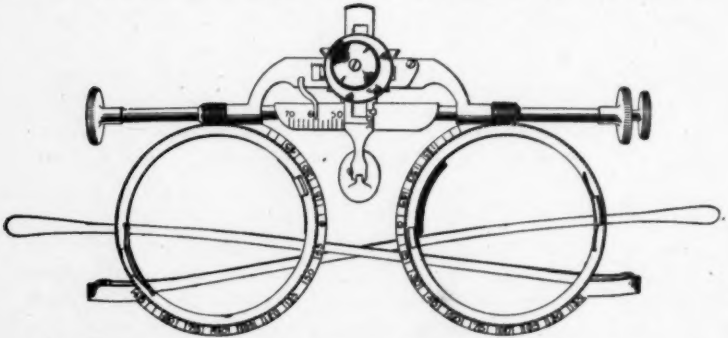
³Ophthalmic Record, December, 1893.

DESCRIPTION OF A NEW TRIAL-FRAME.¹

BY CHARLES A. OLIVER, M. D.

ONE OF THE ATTENDING SURGEONS TO WILLS EYE HOSPITAL; ONE OF THE
OPHTHALMIC SURGEONS TO THE PRESBYTERIAN HOSPITAL; CON-
SULTING OPHTHALMIC SURGEON TO THE MATERNITY
HOSPITAL, PHILADELPHIA, ETC.

THE accompanying wood cut serves to illustrate the general appearance of a test-frame which is intended not only to take the place of the ordinary graduated frame now in common use, but to render that frame lighter in weight, simpler in mechanism, stronger in construction, and to give it greater scope in action. The first three of these improvements have been accomplished by removing all useless and ornamental material from the contrivance, by making all those parts upon which there is no bearing and no strain, of aluminum; and by constructing all of the movable



and adjustable portions of the mechanism of light and delicate pieces of brass and steel. The fourth, which was very imperfectly accomplished in 1878, by Unger, has been obtained by adding a device for the single or combined rotation of such lenses and prisms that require graduated movements to be given to them.

Briefly, the construction of the contrivance is as follows: The main support of the frame consists in a thin, hollow horizontal cylinder of brass, to the front face of which is fastened a narrow inter-pupillary gauge. At the two extremities of this rod there is an encircling narrow band of smooth brass. Arching upwards and

¹Paper read before the November, 1893, meeting of the Section on Ophthalmology of the College of Physicians of Philadelphia.

inwards from these two bands, there are two flat perforated strips of aluminum which can be made to approach or separate from one another through a small compact wedge of brass, by a very simple, though rapidly moving horizontal rack-and-pinion adjustment, thus giving the necessary movement for the regulation of inter-pupillary distances. The degree of this separation is registered by a small curved pointer that plays in front of the graduated portion of the inter-pupillary gauge.

Running through the standard of the central pinion, which is hollow, there is a finer and smaller pinion that connects with an upright graduated rack. Swinging upon the lower edge of this rack there is an adjustable nose-piece which is so hung as to adapt itself to any form of nasal bridge. Any movement given to this smaller pinion produces a perfect vertical adjustment that denotes the height of the bridge of the nose above the pupillary centers—this being accomplished by means of a small indicator on the front face of the rack.

Curving downwards and inwards from the lower and inner portions of the two excentrically placed bands that hold the upper arch and its racks and pinions in position, there are two fixed rings made sufficiently large to hold the rotating cells for the test-lenses. To the lower face of these two rings there is fastened a graduated semi-circle which can be gauged in accordance with the methods of Knapp and Harlan, or with any of the other plans that are ordinarily employed here in the United States, in Great Britain or in Europe. Enclosed within these graduated circles there are two smoothly-fitting revolving cells which move with the greatest freedom and evenness. The outer peripheries of these two rotating cells are cugged to the greatest nicety and the minutest variation of size that is consistent with surety of action and strength of construction. Each cell is provided with a neat contrivance that is so made and situated that one or two of any of the revolving test-lenses can be conveniently and easily slipped in place or removed at any position in which they may be situated.

Fastened to the posterior faces of the two fixed rings, and in fact, constituting a part of them, there are two broad doubly-grooved hooks² for quickly slipping one or two spherical combinations immediately behind the superimposed cylinder or prism. The temples, which are composed of hardened steel, are made long and broad so as to be very much less likely to slip or slide, are

² Any number of grooves that may be desired can be made in these hooks, thus increasing the holding capacity of the frame.

hinged to the lower outer portions of the fixed rings in such positions as to allow the easiest and most convenient situations for rapid changes of test-lenses.

The cugged brass edges of the revolving cells to be used for rotating the test-lenses, are brought into play by two small similarly threaded heads that play over the horizontal steel rods. These bars which extend for a long distance into the central hollow horizontal cylinder and are capped with small thumb-screws, can, when rotated independently, revolve their respective test-lens cells from either right to left, or left to right.

To save trouble and to avoid either using the left hand or leaning over the patient when the opposite eye is tested,³ the left thumb-screw and screw-bar is perforated so as to allow the entrance of a long, fine rod of brass throughout the length of the central hollow bar and far into the length of the opposite screw-bar. The terminal portion of this penetrating rod is squared throughout the length of its penetration into the opposite screw-bar so as to correspond with a similarly shaped and positioned cavity in this screw-bar. The external ending of this long, fine bar which is thus intended to reach, fix, and revolve the rotating mechanism of the right test-lens cell has a small thumb-screw attachment placed upon it in such a position and of such a size as to be conveniently and rapidly moved, independently or combinedly with its fellow thumb-screw. This independence and doubling of motion of these two thumb-screws permit the revolving cells to move the rotating test-lenses either singly to any desired point to the right or to the left, or doubly to the right, or to the left at any degree of similarity or difference of motion; a plan that is of incalculable advantage in the accurate determination of the axis of astigmatism and the angle of prism-deviation during monocular or binocular action. In addition, there is a series of registration marks upon the front face of the revolving cells by which any degree of vertical or horizontal prism action can be readily or quickly obtained without the employment of any series of prisms. The simple, easily adjusted and smoothly working revolving cells of this frame also gives the contrivance a special value and adaption in the ready employment of the various forms of the Maddox-rod test, etc., for orthophoria.

The construction of the instrument has been entrusted to Mr. William S. Yarnall, No. 1406 Chestnut street, Philadelphia, Pa., U. S. A., of whom samples can be obtained.

³ The description reads for the frame as ordinarily constructed, though if desired, the frame can be made with the double-screw attachment placed either upon the right side or upon the left side.

DESCRIPTION OF A NEW OPTOMETER FOR THE
CORRECTION OF ASTIGMATISM BY
DISTANT TESTS.

By CARL WEILAND, M. D.,
OF PHILADELPHIA.

CLINICAL ASSISTANT EYE DEPARTMENT, JEFFERSON MEDICAL COLLEGE
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GREAT is the number of *optometers* that have been constructed by different inventors to facilitate the determination of glasses for the correction of ametropia. These instruments may be divided into *two* classes, according as to whether they are simply a convenient collection of lenses that can be brought in front of the eye successively, or whether only a few (2-4.) lenses are employed which produce by their movement a *continuous* change from one lens to another. The *latter* class comprises the optometers in the strict sense of the word, and are the only ones referred to in this article. In *these* only *spherical* glasses are employed, so that cylindrical lenses can not be determined with them directly, but only indirectly, by ascertaining the different artificial puncta remota for the two principal meridians of the eye. For it is mostly by an *artificial punctum remotum* that the refraction is determined. This, however, leads frequently to very questionable results as *most people, unless under the influence of a mydriatic, are unable to relax their accommodation perfectly, when they observe an object which they know to be only one or two feet off from their eyes.* Furthermore, most optometers make use of a *tubular* arrangement which is also objectionable, as many people feel embarrassed by such an instrument and call their ciliary muscle into activity.¹

¹ As Javal (Mémoires d'Ophthalmométrie page xxxvii) says: "Pour l'As, comme pour la réfraction sphérique, la grande difficulté de l'optométrie est de faire relâcher autant que possible l'accommodation. C'est pour ce motif que nous nous méfions avec juste raison de tous les optomètres où il faut, regarder dans un tube, ce qui, pour beaucoup de sujets, est une incitation à mettre l'accommodation en jeu."

In the following lines an instrument will be described which is used for *distant* test-objects as they are now used at twenty or more feet and in which the spheres and cylinders are not enclosed in a tube. The mathematical deduction will be omitted here, but can be easily supplied by any one who has once mastered the famous section 9, of Helmholtz' *Physiologische Optik*.

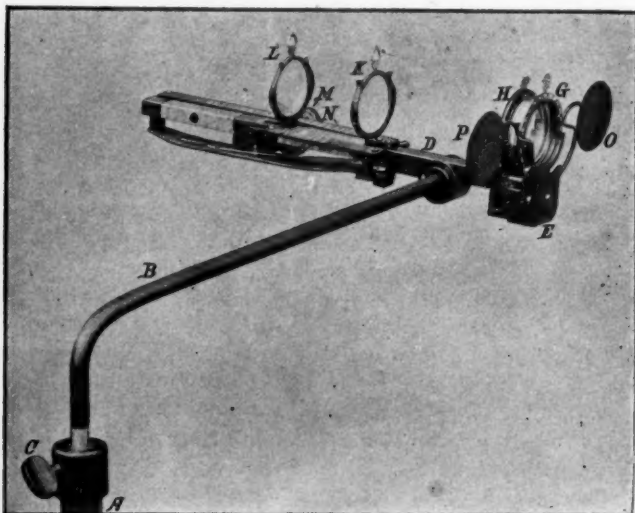
The result upon which the instrument is constructed is the following: If a convex lens of the focal distance f is placed stationary so in front of the eye that the focal point of the glass coincides with the anterior focal point of the eye, about 14 mm. in front of the cornea, and if then a negative lens of exactly the same dioptric value is placed at the distance d in front of the cornea, between the far object and the convex lens, then this combination of lenses is equivalent to a convex lens of $+\frac{f^2}{d}$ focal distance or of $+\frac{1000d}{f^2}$ dioptries placed at the anterior focal point of the eye; at least in so far as the displacement of the *second* principal point of the eye, the value of the two focal distances and the distance of the new second nodal point from the second principal point of the combined system is concerned.² This is a great advantage, as under these circumstances we have *no magnifying action* on the test-letters in axial ametropia, but only the usual change in the retinal images which is necessarily connected with our lenses in the usual position.

² That the combined effect of the two lenses under the conditions mentioned is equal to a new lens of the focal distance $\frac{f^2}{d}$ at the usual position of the glasses can be also easily seen by the following simple consideration: The first negative lens, of course, makes for the positive lens the parallel rays from the distant object appear to come from the focal point of this minus lens. This latter being at d from the convex lens, it is evident that for the convex glass the far object is at $f+d$ in front of it. Further, we know that the distance u of the object from a convex lens and the distance b of the image from this same lens of the focal distance f are in the relation $\frac{1}{b} + \frac{1}{u} = \frac{1}{f}$ from which follows $b = \frac{uf}{u-f}$. Now, in our case the distance of the object u is equal to $f+d$ so that we have $b = \frac{(f+d)f}{f+d-f} = \frac{f^2}{d} + f$. This means that the rays of light from the distant object are made to appear from a point $\frac{f^2}{d} + f$ back of the convex lens or, as this is f in front of the position of the spectacle frame, that the rays of light for our eyes are converging towards a point $\frac{f^2}{d}$ back of us, reckoned from the point just mentioned; quod erat demonstrandum.

In the new instrument a convex lens of $+10$ dioptries or $f=100$ mm. is used, so that the dioptric value of the resulting lens $= \frac{1000 d}{t^2} = \frac{1000 d}{10000} = \frac{d}{10}$ which shows that for every 10 mm. removal of the negative lens the value of the combination increases by one dioptre. Thus a quarter of a dioptre can be easily read off as it is represented by a space of 2.5 mm. To find then the *positive* lenses, it is only necessary to increase the distance between the two spherical lenses and read off the dioptric value on the scale; but for the determination of *negative* lenses an additional minus-sphere must be used, as will be explained later. With regard to these spheres this optometer rests on the same principle as that of Starr, described in the *New York Medical Journal*, April 6, 1892; but he uses a higher convex lens so that the instrument is less sensitive. Furthermore, he incloses all his lenses in a tube and employs *no cylinders* at all to correct astigmatism.

With regard to these cylinders, which are used in the new optometer, it must be remembered that two crossed cylinders are in general equal to a sphere and a cylinder, an easy method of determining which has been lately given in the October number of the *Archives of Ophthalmology*, 1893. In the present instrument two cylinders of minus 3 dioptries each have been utilized, which give the equivalent of a minus 3 D. sphere alone if their axes are at right angles to each other, and a minus 6 D. cylinder alone if both their axes are parallel; while in all intermediate positions of the axes a sphere varying from minus 3 to 0 dioptries is present together with a cylinder ranging from 0 to minus 6 dioptries. Here then arises the difficulty that together with the cylinders a spherical equivalent is introduced, as is the case in Stoke's lens, where, however, a plus 3 and minus 3 cylinder are used. The present instrument is now thus constructed that while the cylinders rotate equally in opposite directions from a position in which their axes are at right angles to each other to that position in which their axes are parallel, while, therefore, the cylindrical element *increases* from 0 to -6 dioptries and the spherical element *decreases* from -3 to 0 dioptries, *at the same time these spheres are constantly neutralized by a movement of the minus ten D. lens from $+3$ to zero.* In this manner nothing but negative cylinders are obtained, ranging from 0 to minus 6 dioptries, while the direction of the axis remains the same throughout the examination. This requires a peculiar mechanical arrangement, because the spheres decrease *equally* by *equal* movements of the minus ten

D. lens while the cylinders increase *equally* only by *different* degrees of rotation for the different dioptric values. Thus, while the sphere decreases from $+3$. to $+2$. by one dioptre, *i. e.*, while the negative lens has to move through one centimeter on the scale, each cylinder has to rotate in an opposite direction by $9^{\circ} 44'$ to get a cylindrical action alone from 0 to minus *one* dioptre. But when the cylinder increases from -5 to -6 dioptries and the sphere decreases from $+1$ to zero D., the minus 10 D. lens has to move again through *one* centimeter as before, while each cylinder has now to rotate through $24^{\circ} 6'$ or twice as quick as before.³



The instrument consists, as the figure shows, of a firm stand which is so constructed that the optometric part can be lowered or raised at *A*, rotated around a *vertical* axis at *C*, and around a horizontal axis at *D*, so that all necessary adjustments can be made to suit the individuality of the patient. *K* represents the $+10$ D. and *L* the -10 D. lens while the two minus 3 dioptic cylinders are to be seen at *G* and *H*. These two lenses, *G* and *H*, are almost in contact with each other and an imaginary plane between them is

³Mr. D. V. Brown, of 740 Sansom street, Philadelphia, was given this idea and calculation, and has succeeded in combining these two movements by means of a specially constructed curve, which works quite satisfactorily. The instrument can be obtained from him.

exactly 10 cm. off from the center of *K*. Near *E* is a little adjustable plate that rests against the facial surface of the superior maxillary bone, and must be so arranged that the cornea is about 14 or 15 mm. off from the imaginary plane between the two cylinders *G* and *H*. At *O* and *P* the two covers are to be seen one of which excludes the eye not examined, from vision.

The optometer is to be used in the following manner: Take out the two cylinders and bring *L* in contact with *K* by turning the screw *M*. Adjust the rest *E* and let the patient look at the usual test-cards, taking first of all, an *astigmatic* chart. Now separate *L* from *K* until everything appears *hazy* and then gradually and slowly bring *L* nearer to *K* until *one* set of lines appear perfectly black. Now stop, read off this positive lens on the scale *N* and put this lens from the test-case in the groove near *H*. Next bring *L* in contact with *K* and put in both cylinders with their axes parallel, and both at right angles to the line most distinctly seen before, e. g. if this clear line was at 75° with their axes at 165° . Now again separate *L* from *K* up to $+4$ D. on the scale, and while the patient again looks at the lines, move *L* further towards *K* until all the lines appear equally black. Read off this cylinder on the left scale and the case of compound hypermetropic astigmatism is corrected, especially after this correction has been verified again by the test-letters. It need hardly be added that in the case of simple hypermetropic astigmatism, one must proceed in the same way as always $+ \text{C. cyl. ax. } 180^\circ = + \text{C. sph. } \ominus - \text{C. cyl. ax. } (180^\circ + 90^\circ)$. This will explain the apparent discrepancy of correcting hypermetropic astigmatism by negative cylinders, a method, which alone is used now by Javal, and is certainly the best if no mydriatic can be employed.

If no improvement can be obtained by the method just described and if all lines remain about equally indistinct, then observe at what distance from the patient's eyes ordinary print must be held to be seen distinctly. If this is e. g. 25 cm., then place a minus sphere of slightly shorter focal distance e. g. -5 D. in the groove near *H* and put *L* at $+5$ D. distance from *K* on the right scale. Now, of course, the whole combination after removal of the cylinders is again zero, and while the patient is again directed to look at the astigmatic chart as before, lens *L* is slowly advanced towards *K*. As soon as one line appears perfectly distinct, read off the $+$ lens on the right scale and now a minus sphere must be placed in the holder near *H*, equal to the algebraic sum of the minus lens used at *H*, and the $+$ lens read off on the scale. Sup-

pose, for example, that with our -5 D. sphere at H we found that we had to move L up to $+1$ to make the first appearing line distinct, then we would have to place a lens in the holder that is $-5 + 1$, which, of course, is -4 . After having taken out the -5 D. lens, and after having replaced it by the new negative lens found before, proceed with the other set of lines in the same way as indicated before in hypermetropic astigmatism. One might say, why not add a minus 10 dioptric lens at H immediately to find the minus sphere necessary for the first meridian. Indeed, this can be done, but then the minus 10 D. lens must be placed accurately at 10 cm. from K and 13-14 mm. off from the patient's cornea, while with the use of lower lenses, one need not be as particular about this. If positive or negative lenses *higher* than 10 dioptries are required, then in the beginning, a plus or minus lens of sufficient strength must be placed in the groove before the instrument is used as indicated above.

This optometer, of course, can be used as an improved Stoke's lens. The latter has never been employed much, certainly for the reason given by Dr. S. M. Burnett in his *Theoretical and Practical Treatise on Astigmatism*, page 33, where he remarks: "It was hoped at one time that this apparatus, on account of its completeness and astigmatic action it was capable of representing, might come into general use in practical ophthalmology. But the combination gives not only a cylindrical action, but also what amounts to a spherical refraction, which constantly varies with the rotation, and must always be taken into account when examinations are made, as they usually are, with parallel rays." The present contrivance does away altogether with this variable spherical element and *gives a purely cylindrical action from zero to six dioptries.*

The advantages claimed for this instrument as an optometer appear to be the following:

1. The instrument is used for *distant* objects, thus *avoiding the tendency to accommodation* so often excited by an artificial punctum remotum.
2. The objects appear of *the same size* as the test-lenses from the trial-case in the usual position make them appear.
3. *No tube* is used that may embarrass the patient and excite his ciliary muscle.
4. It allows to correct astigmatism by the *direct use of cylindrical glasses*, and may also be used as an *improved Stoke's lens*.
5. By using in connection with the *highest +* and the *lowest -* spheres only *negative* cylinders, as is also the practice of Javal, one is more likely to get the *fullest correction for hypermetropia* and to *avoid an over-correction in myopia* in such cases where a mydriatic cannot be employed.

INNERVATIONAL ABNORMALISM THE CAUSE OF
HETEROPHORIA—A NEW METHOD OF TREAT-
MENT OF HETEROPHORIA—A NEW INSTRU-
MENT FOR TESTING ADDUCTION,
ABDUCTION, EXOPHORIA,
AND ESOPHORIA.

BY GEORGE M. GOULD, A. M., M. D.,
OF PHILADELPHIA.

I WISH to call the attention of the readers of the *ANNALS* to the conception of the innervational origin, explanation, and treatment of heterophoria, and to describe an arrangement of prisms for testing with ease and quickness the degrees of adduction, abduction, exophoria or esophoria that may exist.

In reference to the etiology and treatment of exophoria, I will quote somewhat at length, from a previous article in the *Medical News*, of November 18, 1893:

"It appears to me beyond question that in the vast majority of cases of exophoria, if not in all, the seat of the abnormality is purely, at least primarily, and always principally, central, and innervational. It is not at all a question of tendon-insertions or of muscular strengths. A few of many reasons for so thinking are these:

"*a.* In convergence-adduction, the 'muscles' overcoming the maximum of prisms, bases out, that is possible, either internal rectus may be made to greatly increase its contractile power by simply carrying the object to the left or to the right side of the field.

"*b.* Extreme adduction (twenty feet) of exophoric eyes may be doubled, often trebled, in a minute or two by the device of slowly carrying the object gazed at, with weighted convergence-stimulus from the near to the distant point. If, as I said, one can lift with his arms only 200 pounds, one cannot lift 400 or 600 pounds in a minute by any analogous change of the method of lifting,

"*c.* The extreme of primary adduction-power, and even the double of this extreme, may be held continuously for several minutes, even a half-hour or more—I don't know how much longer.

The extreme lift of other bodily muscles can only be held an instant, and not only this, but constant and uninterrupted tension or contraction of such muscles in lifting even very small weights is impossible.

"*d.* Besides all this, such constant tension, when solely muscular, is painful, even agonizing, if demanded by the will or by necessity. In the case of exophoria, the extreme of prisms, and even the double of the extreme, bases out, that can at first be held without diplopia, is in a minute or two continuously held without the faintest suggestion of pain or even of discomfort.

"*e.* Muscular tissue, as such, cannot be made to double or treble its volume or its strength in a few hours or days, or even in a few weeks, but such increase of ocular adduction-power I see many times every day.

"There are many other such considerations, too numerous to mention, all running to prove the same conclusions.

"If, therefore, the seat of the difficulty lies in the innervational centers and co-ordinations, the treatment by tenotomy, or by gymnastic exercises (with weak prisms), seems to fall to the ground. We must instead seek to normalize innervation, leaving the muscles and tendons entirely out of the count. In accordance with this I have sought to break up the bad habit of exophorial innervation, to re-establish normality in an erroneous nervous co-ordination, to heighten convergence-stimulus, and to carry this increased stimulus as well as the naturally heightened stimulus of convergence at near range, into distant and all-around seeing.

"The method I suggest for effecting this normalization of innervation and co-ordination in exophoria is by what I have called 'the weighted convergence-stimulus carried from the near point to the distant point.' In the great majority of cases of subnormal adducting power. I find that the 'weighting' or 'handicapping' by prisms, bases out, is at first about double the primary twenty-foot adduction-power. That is, if the patient has only 10° of such adduction-power, we may at first safely give 20° prisms (total) as the handicap, then slowly carry the object gazed at fixedly and continuously from the near point to the distant point. This is to be repeated until the eyes with 20° prisms can hold objects all about the room easily. The repetition is to continue several times daily until this increased adduction-power is *habitual*, and until no diplopia is produced on first adjusting the prism-fronts (or, better, prism-spectacles) and looking at distant objects immediately, and without the device of carrying the object from the near point to the

distant-point. When this condition has been reached, the strength of the 'handicap-prisms' is to be increased say, to 25° or to 30° , and the method resumed as before. Before an adduction-power of 30° has been reached the symptoms of asthenopia will long have vanished, but the manifest, or the latent exophoria, will still usually, and to some degree, be present. The treatment from 30° to 40° prisms should be continued until all manifest and latent exophoria has disappeared, and 2° of esophoria have become manifest.

"These, of course, are rough and indefinite rules, drawn from my short experience with the method, and they will require adaptation to the peculiarities of each case. Some patients have far greater reaction-power than others, both as to the amount of the 'weighting' of the convergence-stimulus permissible or required, and as to the rapidity of the return of normalization of innervation. But in all cases, so soon as increase of the adduction-power has become stronger and habitual, we should weight the convergence-stimulus with still stronger prisms, so that effort and the device of slow recession of the object gazed at are (at first) required to avoid diplopia on looking at distant objects."

As to esophoria, the exact reverse of the plan, so far as the details of method go, readily suggests itself, though identically the same principle underlies both. In exophoria, if we proceed sensibly and physiologically, we do not want to weaken the not-over-strong abduction-power, but we wish to strengthen the subnormal adduction-power. So in esophoria the adduction-power is not too strong, and the problem is to develop the weak power of abduction.

Prisms, bases in, are therefore placed in the trial frame, the full number of degrees that can be overcome at the extreme of convergence and accommodation. (The ametropic defect is, of course, first corrected in all cases). The object is then brought from beyond the point of fusion-possibility and toward the extreme punctum proximum. As the power of fusion or abduction increases, higher degrees of prisms, bases in, must be worn during the periods of innervation-exercises, until there is normality of twenty feet abduction-power. The length of the exercise periods must be left to the judgment of the oculist as every case is a law unto itself, and particularly so in these departments. But as in exophoria, so in esophoria, there is by no means so much tiring as would be expected, and no pain or even discomfort attends quite protracted exercise. I find it wise to begin with periods of a few minutes each in duration (reading moderately fine print, varied with exer-

cises in bringing appropriately sized test letters from *beyond* the point of fusion to a position *within* the point of fusion), and six to twelve exercises a day.

In hyperphoria, it is plain that we should seek to weight the convergence-stimulus with prisms up to the extreme power of fusion at the near point, the placing of the prisms being such as to develop the weaker function, and the object being held horizontal with the eye. Then, the head being kept rigid, the object at the near point should be slowly carried upward and downward, the gaze being kept riveted upon it until the full sweep of the eyes upward and downward can be carried out without diplopia. The length of the periods of exercise will be dictated by good judgment, as also the strengths of the prisms used. The approximation to orthophoria is, of course, followed with increase of prism strengths.

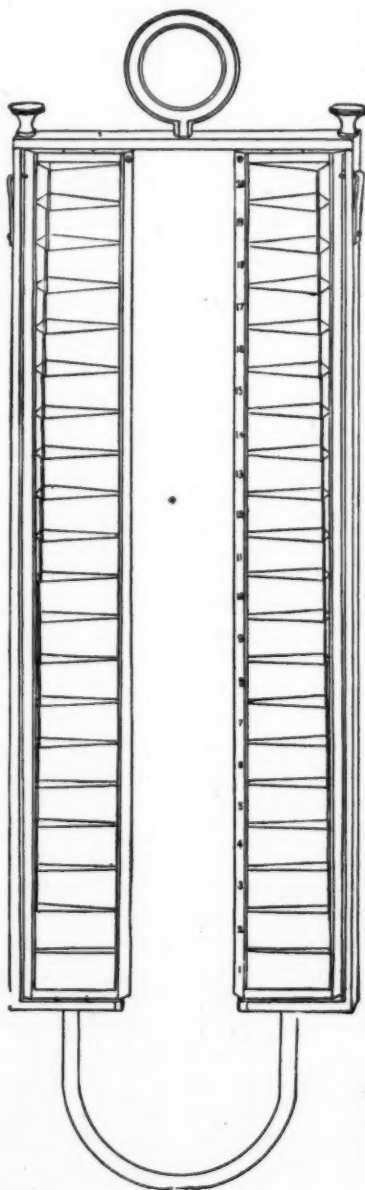
A highly important condition of success in all these exercises is the arousing of latent innervational power by the will and effort of the patient. To this end constant encouragement and command is necessary that the patient shall look "hard," "fiercely," "scowlingly," riveting the gaze upon the object with the full power of the will. The "scowl" is especially a powerful aid. Physiologic function, and even organs themselves in the long run, are the products of desire, effort, repetition and habit.

In exophoria I have had the most gratifying success in curing a large number of cases. I have yet to meet a single case of failure.

The permanency of the cure has been questioned. I have re-examined perhaps a dozen cases after two, three, or four months had elapsed, and I have not found an instance of any weakening of the normal adduction-power once regained, nor of any tendency to the return of exophoria.

In esophoria and in hyperphoria, every case I have seen reacts to the treatment, but such cases are comparatively few, and my experience is, as yet, too limited to report results, or to be firm in my therapeutic conclusions. I have briefly epitomized the plan of treatment I have adopted in such cases in order that others who have written me enthusiastically of their results by the plan advised in exophoria, may also experiment upon these other forms of heterophoria at the same time with myself.

In testing exophoria and esophoria, and the power of adduction or of abduction, I have found the common methods in use both time-wasting and vexatious, and have suggested to the opticians, Messrs. Wall & Ochs, 1702 Chestnut St., Philadelphia, that a double series, "battery" or "pile" of prisms would be of service. The illustration given herewith is the result of our mutual efforts, and after thoroughly testing the instrument I commend it as mechanically



beautifully made, and scientifically admirably effective and convenient. The prisms begin with 1° lenses upon each side and increase by integers to 20° , so that with 2° steps one may test all degrees of adduction or of abduction from 2° to 40° . The open central space permits the lenses to be brought close to the eyes without any interference with the patient's nose. The larger handle below allows the first tests to be made with the lower-power prisms, likewise without the handle striking the nose. The lower-power prisms are placed below in order that in testing from low powers to higher powers, the breath of the patient may not cloud the lenses to be used next in order. To test adduction each "battery" is placed "bases out;" to test abduction, each is revolved so that the bases are "in." To test exophoria and esophoria, the same methods are pursued, the maddox-rod (*red*) being first placed before one eye in the trial-frames. Each battery is revolved at pleasure, being fixed by a pivot-mechanism below and above, and temporarily held in the position desired by clutches at the sides. By this mechanism the four tests desired may be made with great celerity and ease. The instrument may also be used for short periods of exercise in adduction and abduction. The illustration is one-half size.

SOME AIDS TO ACCURACY IN THE CORRECTION OF
ASTIGMATISM, WITH A CUT OF A TRIPLE
TRIAL CYLINDER, AND ONE OF AN
AXIS-INDICATOR.

BY ARTHUR E. PRINCE, M. D., PH. D.,
OF SPRINGFIELD, ILL.

PROGRESSION in ophthalmology is marked by a growing tendency to take account of small errors, and especially those of asymmetrical refraction.

Comparatively a few years ago, the weakest cylindrical lens in the trial case was one-sixtieth, and an error of less amount was regarded as normal. With the adoption of the metric method of denoting lenses, 0.25 became the minimum, but was relatively seldom prescribed until within the past five years. Dr. Chisolm's paper on the value of the 0.25 cylinder, read before the Ophthalmological Section of the American Medical Association, in 1879, did much to popularize the use of the fourth dioptré. Since that time account has been taken of intermediate degrees, and the 0.12 C., 0.37 C., and 0.62 C., are found in every complete case.

With this refinement in the refracting quality an equal demand is made for precision in the location of the axis. This is made manifest by the continuous efforts to perfect the trial frame. The weight of most complicated frames makes them more or less unsatisfactory. There is, besides, the frequency of asymmetry of the face and location of the ears, which demands constant watchfulness, lest the consequent malposition of the frame on the face will vitiate the reading of the angle on the graduated margin.

It is my belief that a gain in accuracy, as well as in comfort, would result from the abandonment of the heavy graduated trial frames with revolving cells which accompanies every trial case.

About ten years ago I discarded the revolving cell upon the discovery that by mounting the axis at an angle of forty-five degrees, the lens could be rotated in a light, simple cell, and made to assume any given angle. This idea I communicated to the Geneva

Optical Company, and to F. A. Hardy & Co., who adopted this method of mounting cylinders, since which time it has become almost universal.

In a recent interview with Dr. Jackson, of Philadelphia, I was gratified to learn that he had abandoned the graduated frame, and adopted an ingenious and exceedingly simple device for determining the degree of inclination of the trial cylinder. The frame employed is of flexible wire, so that it may be easily conformed to rest horizontally before the eyes. The most acceptable axis having been found, the frame is removed from the face, and the center of each cylinder is placed in turn over the center of a graduated circle of about six centimeters radius, the axis being parallel to the horizontal diameter. The point of the circle at the intersection of an imaginary line through the centers of the lenses indicates the exact inclination of the cylinder axis. The upper semi-circle is graduated from right to left, and the lower from left to right.

It has been my practice to superpose the center of the cylinder over a small graduated circle, and select the radius which corresponds with the axis.

In the application of either of these methods, the frame must rest horizontally, and it must be removed from the face and applied over a diagram. To avoid this inconvenience and possible source of error, the thought occurred to me some time since, of suspending a protractor from a pivot, through a delicate rod, in such a manner that any given inclination of the rod would be indicated by the corresponding division on the protractor.

A rough model was made, and its usefulness was found more extensive than was at first imagined.

Not only was it found convenient to determine the inclination of a trial cylinder, but was equally efficient in determining the axis of a mounted cylinder, the location of which may have been determined by either of the various methods.

It may also be found useful in connection with retinoscopy.

The observer sees in the patient's eye the band of light corresponding to the axis. With most persons, when this is horizontal or vertical, no question arises regarding its position; but when it is inclined, few will agree upon the degree of the inclination.

A convenient method of locating it is to place in the frame a trial cell across which is drawn a distinct line, which, by rotation, is rendered apparently parallel to the shadow-reflex. Those who are not deterred by the inaccuracies of the graduated frame may be satisfied with noting the corresponding angle on the margin.

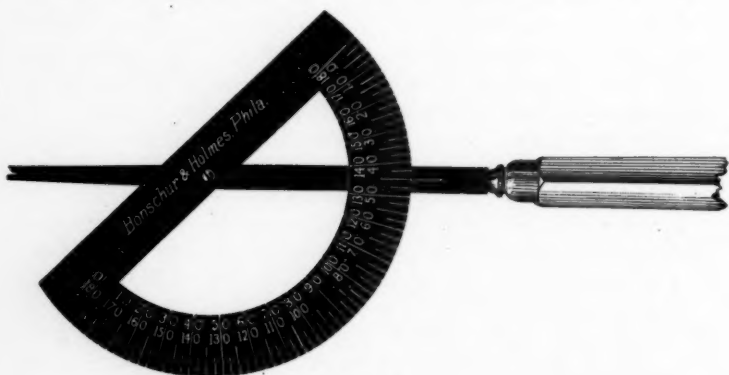
More accuracy and expedition, however, are obtained by placing the rod so that it may be seen parallel to the shadow, and reading the angle of inclination on the margin of the protractor.

This axis indicator, of which the accompanying cut has been furnished by Bonschur & Holmes, of Philadelphia, may be christened an "*astig-goniometer*" which may dignify its journey to oblivion after it has been superseded by a superior instrument:

PRISOPTOMETER.

Here I desire to express my appreciation of Dr. Culbertson's contribution to ophthalmology, viz.: *The Prisoptometer*.

It is thought to be superior to the Snellen fan and to those instru-



(FIG. 1.)

NOTE:—In the construction of the above instrument the outer numbering is omitted, and the superior horizontal line is broken by an arc to receive the pressure of the thumb or fingers to prevent further motion, in case the rod is held in the pendant position.

ments which depend for their results on the distortion of a small illuminated light source, the best of which is Hotz's Astigmometer. In the presence of small errors, the answers of the patients are not usually reliable. Small images, besides, are distorted by minute defects in curvature which do not correspond to the general curvature of the cornea. The prisoptometer test object is so large that the images are proportionately less distorted by minute imperfections of transparency or curvature. Besides, the relatively small aperture excludes all peripheral imperfections of the cornea, even though a mydriatic may have been employed. To these facts is due the superiority of the instrument in the presence of irregular astigmatism and partial opacity of the dioptric media which preclude

the employment of objective methods. The fact, that the only answer required relates to the exact touching of the two circles, makes the instrument especially available when a subjective test is deemed desirable in the examination of children, the stupid, ignorant, amblyopic, and deaf and dumb.

The readiness with which one rotation of the prism will indicate the character of the astigmatism, whether simple or compound, hypermetropic, myopic or mixed, with or against the rule, and its relation to hypermetropia, or myopia, makes it a great time-saver for the busy practitioner.

The main objection to the instrument is the necessity for centering the eye behind the divided prism, and the absence of any provision to secure this object. If accurately centered, the *manifest* error, when of moderate degree, may be accurately measured, but a lateral motion of the head causes an apparent error.

This objection would have doubtless been overcome, had not the application of the divided prism to ametrometry been covered by a patent, which has caused it to remain without improvement in its present crude state, without head rest, centering arrangement, or combination of lenses, by the addition of which it is to be expected the instrument will be improved after the restriction has expired by the fifteen year limitation.

TRIAL TESTS.

The oldest, and still when available, the ultimate test, whether subjective or objective, is the test of vision obtained by a comparative trial of various spherical and cylindrical lenses. To curtail the consumption of time and exhaustion of patience attendant on the random pursuance of this method, Dr. Jackson, in the *Ophthalmic Record*, has suggested the use of a plus cylinder crossed on a corresponding minus cylinder. The conceived advantage of this combination arises from the simultaneous modification of both meridians, thus deriving an indication relative to the change desirable in both cylinder and sphere.

The operation of the crossed cylinder may be shown by the following example:

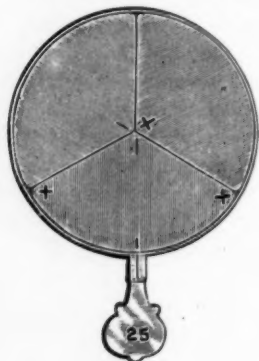
Assume the refraction to be $+ 1.00$ S., $+ 0.50$ C. 90° . The spherical which will be preferred will be that which will correct half of the cylindrical error, viz: $+ 1.25$, leaving uncorrected $+ 0.25$ C. $90^\circ \ominus 0.25$ C. 180° . The effect of the crossed cylinder 0.25 C. $90^\circ - .25$ C. 180° will be more apparent than either the 0.25 cylinder or the 0.50 C. with axis held before either meridian. The indications, however, derived from this test, regarding

changes to be made in the combination before the eye, are not so accurate as those obtained by the presentation of the axis of the plus and minus cylinders successively before each principal meridian.

The principal objection to this latter method arises from the inconvenience of handling a variety of lenses so as to bring them in the desired succession rapidly before the eye.

This view gave rise to the conception of combining three cylinders in the trial frame, after the manner of constructing the perfection bifocal, and such a Triple Trial Cylinder was made for me by F. A. Hardy, of Chicago.

The shape of the lenses has since been changed, making the elements equilateral as shown in the cut, (Fig. 2).



(FIG. 2.)

The axis of the simple cylinders are so mounted that either, by the rotation of the handle, may be alternately presented before each principal meridian or before the axis of the cylinder which may be in the trial frame.

Credit is due to the manufacturer for his suggestions relative to indicating the axis of each element in the combination, by making the junction angle correspond with the axis of each cylinder in the combination, and indicating the strength on the handle. The practical application of this combined cylinder may be illustrated by an hypothetical case. Before the eye place $+ 1.00$ S. $+ 0.50$ C. 90° . Each cylinder is now rotated before either principal meridian: Minus 0.25 C. 90° is accepted, but $+ 0.25$ C. 180° is preferred. This would indicate an increase in the strength of sphere, and a reduction in the refraction of the cylinder. Make this spherical change and repeat the observation. Minus 0.25 C. 90°

is now preferred, indicating $+ 1.25 \text{ S.} + .25 \text{ C. } 00^\circ$. Preference over nothing is now shown for neither $+ 0.25 \text{ C. } 180^\circ$ nor $0.25 \text{ C. } 180^\circ$, but $+ 0.25 \text{ C. } 90^\circ$ is preferred over $- 0.25 \text{ C. } 90^\circ$, indicating an increase of less than 0.25 C. in the vertical meridian. Hence the correction would be $+ 1.25 \text{ S.} + .37 \text{ C. } 90^\circ$.

From the above it is observed: First, that a comparison of minus and plus cylinders with axes corresponding to that of the trial cylinder before the eyes will furnish a guide relative to changes in the strength of the cylinder. Second, a comparison with the axes crossed before that of the cylinder in the combination will serve as a guide relative to modifying the spherical as well.

The event in which a guide toward the correct modification is not rendered by the above comparison is that of a spherical error remaining after the cylindrical correction is final. This final test must be made with a sphere, in accordance with which fact the suggestion is made for a Triple Trial Sphere, consisting of $+ 0.25 \text{ S.}$, $- 0.25 \text{ S.}$, and $- 0.12 \text{ S.}$

In the lens, illustrated in the cut, the crossed cylinder has been given a position in the combination in order that any advantage it may have may be more readily established, but thus far I am inclined to place a superior estimate on the co-apposition of the plus and minus cylinder in the combination, and favor the reduction of the size to a quadrant and the substitution of a plus and a minus sphere for the crossed cylinder.

It is believed that such a lens, made in various strengths, will prove an acceptable substitute for both the Triple Cylinder and Sphere, which have been found such an aid as to entitle them to a place in every trial case.

OBJECTIVE METHOD.

Even with the greatest care, the subjective methods, not infrequently, lead to error, and a certain amount of insecurity is always experienced unless the result be corroborated by an objective examination.

The keratometer of Helmholtz laid the corner stone, and this simplified by Javal and Schiötz, has placed in the hands of the ophthalmologist an instrument, which, within its proper sphere, for mathematical precision and facility of employment, leaves little to be desired.

It is, however, to be borne in mind that it is a keratometer and not an ophthalmometer. It is a source of regret that so many false claims have been set up by ardent enthusiasts. The more conservative, doubtless among whom is Helmholtz himself, recognize

the fact that astigmatism is often lenticular. Indeed, the first case ever recorded, viz: that of Mr. Young, discovered in his own eye, and reported in the Transactions of the Philological Society, London, 1801, was largely lenticular. The axis was determined and the degree measured by means of fine wires, and the influence of the cornea excluded by immersing the eye in water.

It is, however, a coincidence of great physiological convenience that the principal meridians of the lens, and those of the anterior surface of the cornea, usually correspond, so that the influence of the lens in determining the axis of the astigmatism in but a minority of instances vitiates the reading of the keratometer.

If the observations of Lautenbach (*Ophthalmic Record*, December, 1893) be correct, we are to expect a failure on the part of the ophthalmometer to determine the axis with precision in but twelve per cent of the cases examined. According to the same observer, the reading of the keratometer corresponds in degree with that determined under a mydriatic (after making the correction of 0.37 D., subtracting it when the astigmatism was with the rule, and adding it when it was against the rule), in but forty-five per cent of the eyes examined. The following mechanical dangers against which one should be guarded are noted:

"A malposition or displacement of the Wallaston prism is frequent. Instead of the primary image revolving about its center with the revolution of the prism, it has in addition another motion about an imaginary center, the secondary image in either case moving about the primary one. If the arc be not in proper position, again are the results valueless."

Finally, it seems almost needless to mention the malposition of the head, and the direction of the eye as a possible source of error. The instrument furnishes no means by which the observer may know the influence of the other refracting surfaces, hence it cannot be relied upon unaided by other methods, but is, nevertheless, taken in conjunction with other means, a decided aid to accurate diagnosis in all otherwise doubtful cases.

SKIASCOPY.

The only objective method which takes into consideration all the media of the eye and lays any claim to accuracy, as understood at the present day, is the "shadow test," skiascopy, or more familiarly, retinoscopy.

In the days when accuracy in the determination of astigmatism was limited by 0.50 C. or 1.00 S., the ophthalmoscope was an available diagnostic aid, but in comparison with skiascopy it merits no longer a primary position.

Though the fact, that the axis of astigmatism could be demonstrated by the plain mirror, was known to William Bowman previous to 1864, the knowledge had no practical value until after 1873, when Cuignet demonstrated the philosophy of the shadow movements.

In the employment of the method, the requisites of accuracy are a dark room, proper illumination, a regular cornea, transparent media and cycloplegia. Given these, an appropriate instrument, and a certain degree of skill, the method fills a want not otherwise supplied.

It locates the axis in small degrees of error, determines with accuracy the nature and quantity of the cylindrical error, and with almost the same degree of precision the spherical error with which it may be associated.

Regarding the employment of the method, differences in details are numerous. Some prefer a large, while others, including Jackson and Thorington, advocate a small mirror. In certain schools the concave mirror has the preference; in others it is almost excluded in favor of the plane. One writer advocates a perforation; others regard the most valuable portion of the mirror lost by its perforation. Some confine their observations to within a distance of one meter; others find the greatest delicacy in the long range of from three to six inches. With some, the variable point of observation constitutes its delicacy; others preserve a fixed distance and modulate the effect wholly by means of trial lenses. By some, each principal meridian is corrected separately by means of spherical lenses; by others the astigmatism is estimated by means of cylinders. The source of illumination varies between an uncovered Argand burner and a small circular aperture in an opaque shield. Difference of opinion exists as to whether the source of illumination shall be back of the patient's head or approximated to the eye of the observer.

With these numerous points at issue, the liberty is taken of giving special mention to the method as employed in Wills Ophthalmic Hospital where sufficiently accurate results are attained to entitle retinoscopy to a consideration under the above title.

The room is as dark as it can conveniently be made. The Argand burner is screened, except at a perforation one centimeter in diameter, to furnish illumination (the Wellsbach burner is still better).

The skiascope preferred is that of Thorington, and consists of a small, plain imperforate mirror 18 mm. in diameter, with central

transparent area. The observer places his eye about twenty-five centimeters from the aperture and reflects the light onto the eye of the patient situated just one meter distant. If astigmatism is present, the rotation of the mirror about various axes will cause the shadow to appear, which will be most distinct in the axis of one principal meridian. With the proper correction of one dioptré for the distance of one meter, the spherical lens required to neutralize the motion in each of the principal meridians will represent the astigmatism, which result may also be verified by means of cylinders used in conjunction with the correcting sphericals.

While it is usually possible to locate the meridian by the inclination of the light band as seen in the pupillary area, it has not been found easy to determine the exact angle of inclination. To this end I trust that the foregoing astig-goniometer may serve a useful purpose.

THE TREATMENT OF INTERNAL SQUINT.

BY HOWARD F. HANSELL, M. D.
OF PHILADELPHIA.

DONDERS promulgated, many years ago, a theory in explanation of internal squint, which has been accepted by students of ophthalmology. The treatment indicated by him has been universally followed, with varying degrees of success. Since, in hypermetropia, good acuity of vision is obtained only by abnormal stimulation of accommodation, and since excessive ciliary contraction necessarily induces excessive convergence, convergent squint is caused by hypermetropia, (Donders). The reasoning is physiological. The exceptions to this doctrine are, however, so numerous that we are forced to look for other causes. For example, Donders's theory will not explain convergent squint in emmetropia and myopia; it will not explain why squint is not found in all cases of hypermetropia; it will not explain that, in some cases, either eye is used in fixation, and in others, always the same one; it will not explain amblyopia. If we accept this theory of causation, the treatment becomes uniform, and the prognosis good in all cases. The necessity for ciliary cramp is obviated by a correction of hypermetropia, and the stimulus to excessive convergence is removed. In practice, we find a comparatively small proportion of internal squints (25%) obtain binocular fixation for all distances as a result of attention directed to hypermetropia and convergence alone. Schneller, (*Archiv. f. Ophth.* Bd. 36, Pt. III), says: "In order that true squint shall be induced out of strong adduction, caused by disproportionately great accommodation, other agents must co-operate. First, the value of binocular vision must be reduced, since single vision hinders squint. Second, the existence of qualities favoring convergence, such as a small angle alpha, and build and innervation of the eye muscles." He concludes his elaborate article, "A Contribution to the Theory of Squint" by an enumeration of causes: first, innervation; second, the nature of the muscles subject to the innervation; third, anomalous accommodation; fourth, opposing forces, such as the elasticity of the

muscles, the relation of their diameters to the position of the point of rotation, the length of the eyes, their position in the orbits and their inclination to the middle axes.

All cases of functional internal squint are simple or compound, uncomplicated or complicated. The simple includes those cases to which the axes of vision deviate from equilibrium laterally only, in which binocular vision can be secured and maintained by correction of the error of refraction and tenotomy. In other words, the dynamic apparatus is not prevented by organic deficiencies from responding to the effort at fusion. The compound includes those cases in which an organic change—in the muscles or their tendinous insertions, in the optic nerve, retina or cerebral centers, or in the form of the ball—will preclude binocular vision.

Whatever may be the true theory of internal squint, whether it be pure innervation, or whether it be abnormal response to the innervation, it is essential to the cure that the relative positions assumed by the eyeballs, in near and distant vision, should be investigated. Accurate information cannot be obtained by an objective study of the balls themselves, but only by an analysis of the false and true images in their relations to one another. Hence, instruments for the diagnosis of the degree of squint, which have as their basis a comparison of the situation on the straight and on the deflected cornea of the reflection of a bright object, are manifestly inferior to the simpler method of compelling the patient to recognize a false and a true image of a candle flame at various distances. False projection and false answers may lead to confusion, but only in exceptionable instances.

First, simple, uncomplicated squint. The patient fixes the candle light with either eye indifferently since the cause of the abnormal convergence lies in the innervation. There is no amblyopia. The error of refraction may be high or low, but the difference between the two eyes does not exceed 3-4 D. The false and true images are on one horizontal plane. At 6 m. the space between the lights varies in the same individual at different times, averaging, perhaps, 1 m. Should the patient refuse to acknowledge the two lights, as is usually the case, for diplopia is never a complaint of functional squint, glasses of different colors, red and dark blue for example, held in the spectacle frame before the eyes, will invariably solve the difficulty after a few trials. Correction of the optical defect relieving all extraordinary strain on the accommodation, will, in the cases in which the squint has not become habitual, when constantly worn, suffice to effect a cure.

In the large proportion of cases, tenotomy must be made. It must be borne in mind that convergent strabismus is, in all functional cases, an affair of two eyes. It does not concern either internal rectus alone, hence both muscles should be tenotomized in as nearly as possible equal degree, either at the same or different sittings, preferably the former. Having obtained by these means binocular vision, no anxiety need be felt as to the final and permanent result, for now, under the altered circumstances of physiologically responsive muscles, normal innervation will produce normal results, and fusion force will maintain binocular fixation.

Second, compound or complicated squint. Upward or downward deviation of the visual lines. The innervation theory is accepted as sufficiently explanatory of functional, simple convergent squint as described above. It is equally applicable, when other than the interni are functionally innervated beyond the normal limit of equilibrium. If internal strabismus depends upon excessive contraction of the interni, induced by the necessary effort of the ciliary muscle to overcome hypermetropia through their innervation by the motor oculi, it is logical to presume a relatively equal overaction of all the muscles supplied by that nerve. If, now, for any reason, one or more of these muscles responds to the stimulus by super or subnormal contraction, the result must be a disturbance of vertical equilibrium through a rotation of one or both balls. Such reasons may be purely mechanical, such as unsymmetrical positions of the globes in the orbits; or anatomical, such as an inequality in the centers of rotation from a longer or shorter antero-posterior diameter, or muscular from anomalies of accommodation, length, diameters and attachments of the external muscles, or of the axes of the orbits. It is illogical to assume that the four lateral muscles alone will be disturbed in their equilibrium, and that four vertical and two oblique will coterminously maintain their balance. To the observer, the most apparent defect is an inward rotation of the cornea, readily explained by the relatively greater power of the interni. By prism measurement the interni overcomes 25° — 50° or even more at 6 m., while at the same distance the elevators and depressors can fuse images through only 3° — 4° . Hence, an upward or downward deviation of 2° — 3° , angular measurement, very important in its effects, can be observed only with the greatest difficulty or perhaps will escape notice, while a relatively equal convergence produces a deformity, noticeable at a glance. A vertical insufficiency, great enough to vitiate any attempt at operative correction, will invariably be over-

looked if the means of diagnosis are confined to objective methods. Therefore a correct diagnosis of muscular anomalies can be reached only through study of the double images. I here take the opportunity to emphasize the absolute necessity of this indispensable aid to accurate diagnosis, and to assert that by this means alone can we arrive at a successful issue by operative treatment. Moreover, the utmost capability of vision of each eye must be developed by repeated trial with the test lenses. A proportion of cases of so-called amblyopia may be taken out of that category and placed among useful eyes by careful attention to spherical, and particularly cylindrical, defects. Through the glasses which give most rest to the accommodation and the best acuity of vision, the tests for diplopia must be made. Recognition of the false image will be facilitated if the true image be made indistinct by means of a dark blue glass, or if a strong prism, with its base out, be placed before the squinting eye in order to bring the object to be seen by that eye into the neighborhood of the true image. A patient may refuse to confess a false image when the displacement is great. In the majority of complicated squints, vision differs materially in the two eyes. In the good eye, it is usually $\frac{6}{7\frac{1}{2}}$ or better, and in the bad, $\frac{6}{60}$ or worse, and the squint is constant, the better eye being used for fixation, while the worse bears the total super-normal convergence. But we must not be misled by this condition into supposing that we have to deal with a monocular defect, and thus direct our treatment to the deflected eye only, since in all cases that belong to the innervation theory—absence of anatomical changes—the squint will either entirely disappear or be transferred to the fixing eye, under conditions of general muscular rest, ether narcosis, sleep, or death, so that the word “constant” as applied to this form of squint is not strictly accurate. The squint is constant only when the eyes are functioning.

In simple convergent strabismus, the true and false image are in the same horizontal plane. (This statement is not strictly true in high degrees of squint when the lights are separated by a wide interval. Here there may be an inconsiderable vertical displacement, and perhaps tilting of the false image, owing either to an inclination of the patient's head or the unopposed action of the inferior oblique muscles). If, however, the two horizontal planes are separated by a vertical interval of an inch or more at 6 m. we must recognize the vertical deviation of the optic axes as an important factor in the treatment. It teaches us that there is more to consider than excessive convergence. We admit the relation be-

tween the ciliary and the interni; must we not admit a similar causative relation between the ciliary and *all* the muscles stimulated by the efferent impulse through the motor oculi? Thus are involved the superior and inferior rectus and the inferior oblique. The impulse to abnormal convergence is responded to in all cases by one internal rectus in order that one eye may be used in fixation. For the same reason, the impulse to vertical deviation must stimulate one set of elevators or depressors. Since elevation of the cornea is under the control of the superior rectus and inferior oblique, and depression, of the inferior rectus and superior oblique, we should, logically, expect to find the squinting eye deviating upward, since the elevators receive the greater impulse. This is the actual condition in the majority of cases of compound strabismus or heterophoria.

A second complication is amblyopia. Our knowledge of amblyopia is purely speculative. We recognize it by its negative qualities. In a paper on "An Analysis of Fifty Successive Cases of Squint," read before the Ophthalmological Section of the Pan-American Congress, I presented the following conclusions:

"1. That congenital amblyopia is almost uniformly present in constant internal squint.

"2. Amblyopia is not essential to squint, either constant or alternating.

"3. Amblyopia is found in hypermetropia without squint.

"4. Amblyopia is not a condition of alternating squint.

"5. Amblyopia precedes the appearance of squint and is not a result of non-use."

If we accept these conclusions we are compelled to believe that amblyopia is a positive element in producing squint, and in determining the squinting eye, and that it has an important bearing on the prognosis. We can seldom look for binocular fixation from operation, since an essential factor in maintaining this result is wanting—the effort or desire for fusion. We may equalize muscular contraction, but unless images are formed with equal, or nearly equal, clearness on the fovea centralis of each retina, so that the brain can recognize them as images of one and the same object, there is no incentive to co-ordinate the visual axes and hold them in equilibrium, but rather the desire to turn that fovea on which the diffused, unclear image is projected, away from fixation in order that there be no disturbing or misleading confusion of images, with resulting imperfect conception of the object.

Having determined, by the absence of amblyopia and by the

positions of the true and false images, that we have to deal with an uncomplicated case of squint.

1. A careful and full correction of an existing optical defect must be worn sufficiently long to estimate its effect in lessening the degree of squint. The behavior of the eyes under mydriasis will foreshadow this effect. If the squint disappears under atropine it will not return, or only temporarily, under full correction. If the images are not fused.

2. Tenotomy must be done. Each internal rectus should be partially or wholly divided by severing the tendons only, until the false has been superimposed on the true image, each step in the operation being carefully watched. Division of the upper and lower radiating attachments will cause a permanent diminution in the range of convergence and a retrocession of the inner canthus; and

3. If convergence still persists, advancement of one or both external tendons is to be preferred to a second tenotomy.

The treatment of complicated internal squint includes:

1. Improvement of vision.

(a) A careful and full correction of all optical defects.

(b) Amblyopia. It is reported that in very early childhood amblyopia can be cured by training the amblyopic eye, by excluding the fixing eye from participation in the act of vision for days and weeks at a time by means of bandages or atropine. This method is conservative and doubtless efficacious in a few cases and invalidates the excuse for early operation frequently given, that the vision of the squinting eye will still further deteriorate.

(c) The proper age for operation. As is well-known, a want of co-ordination of the eye muscles in infants is common. A child may be several years old before it learns to bring both eyes into harness. This is a second and forcible objection to early interference. The rule, usually followed, is to wait until the child is old enough to wear glasses. I contend that this is too early. The patient should be sufficiently intelligent to discern double images with the tests employed and *to give accurate information of their relative positions.*

(d) Hyperesophoria. Probably 75% of all cases of internal squint are complicated by an upward deviation of one cornea. It, therefore, is essential to successful treatment, that vertical as well as horizontal equilibrium must be secured. Indeed, it is not improbable, that in a few cases of oblique turning of the cornea, esotropia depends upon hypertropia. This statement is corroborated

rated, clinically, by a case reported by me in the N. Y. Med. Rec., Aug. 26, 1893. Girl, aged 5. Hypermetropia 2.50 D, wide internal squint, fixes with R. Interni divided, under ether, August, 1891. Apparent equilibrium, one week later. In June, 1893, again internal squint and the same treatment. Two weeks later the squint is apparently as bad as before the first operation. I am now able to diagnose L. hypertropia 3° . L. super-rectus divided; *the convergence becomes immediately divergence.*

I am convinced that my experience is not unique, and that convergent squint treated according to the usual and routine method, is more often a failure than a success. The results amply prove that our conception of the physiology of hypermetropic squint is too limited, and that it should be extended to include the action of the elevators and depressors in conjunction with the interni.

2. Equilibrium through operation. The surgical treatment must be carried out under cocaine anesthesia, since abolition of consciousness is incompatible with scientific accuracy.

(a) Restoration of vertical equilibrium by tenotomy of the superior rectus of the upward, and if necessary, the inferior of the downward deviating eye.

(b) Restoration of horizontal equilibrium by tenotomy of both internal muscles, and if necessary, advancement of one or both externi.

A CASE OF ACUTE SUPPURATIVE OTITIS MEDIA.
CHARACTERIZED BY HIGH TEMPERATURE
AND SYMPTOMS OF BRAIN COMPLICATION. OPERATION. RECOVERY.

BY GORHAM BACON, M. D.
OF NEW YORK.

LOUISE N., aged 6, a patient of Dr. G. M. White, with whom I saw the case in consultation, on March 10, 1893. The history was that two years previously she had a discharge from both ears which soon yielded to treatment. About ten days ago the patient had an attack of false croup, from which she seemed to have recovered, except for a slight nasal catarrh which remained.

On March 4, she had an earache in the left ear which lasted only for two hours, for which Dr. White prescribed dry heat and drops of laudanum and glycerin. Only once again did she have any earache after this.

On March 7, she began to have some elevation of temperature. She complained of no pain about the ear, and it was only after a careful examination of the patient, that a painful spot was discovered by pressure over the left mastoid. There was a slight redness and swelling in this region. This condition of affairs was noticed on March 10. There was no swelling nor pain about the right mastoid.

Two days before this, on March 8, the temperature was $101\frac{2}{3}^{\circ}$ F. at 8:30 a. m., and 105° F. in the evening. On the following day the same fluctuation in the temperature was noticed, and for this rise in temperature small doses of phenacetine were prescribed. She had also had large doses of quinine for the past three days, as the temperature was suggestive of malarial fever, but this was given without any effect on the temperature.

I saw the patient in consultation on March 10, at 10 p. m. The temperature during the day had not been lower at any time than $101\frac{1}{2}^{\circ}$ F., the highest point reached being $105\frac{3}{4}^{\circ}$ F. at noon, and at this time, for an hour, she complained of some earache. The evening temperature was $104\frac{3}{4}^{\circ}$ F. Phenacetine was given in small doses whenever the temperature was high.

I advised using cold by means of the Leiter coil applied over the mastoid, and douching the ear every two hours with a weak solution of boric acid as hot as could comfortably be used. The membrana tympani was congested, especially so about Shrapnell's membrane.

March 11. When seen today at 2 p. m., the temperature was almost as high as on the previous day, having been $104\frac{1}{2}^{\circ}$ F. at noon, and there was the same tenderness on pressure and swelling of the mastoid. I advised operation. Ether was administered by Dr. White, and assisted by Dr. J. Hewitt, I made an incision over the mastoid down to the bone and close to the attachment of the pinna. There was a little softened bone which I scraped away, in the opening in the bone which I made with chisels, at a point a

little above the level of the external meatus and in the direction of the mastoid antrum. As I did not find any pus in this region, I did not think it necessary to force a passage through apparently healthy bone into the antrum and middle ear. As there existed a distinct swelling of the canal in the posterior and upper wall, and in Shrapnell's membrane, I made a free incision in these parts, but blood only escaped. The sinus in the mastoid was washed with a carbolic acid solution and a tent of iodoform gauze inserted and the ear bandaged.

March 12, 8 a. m., temperature 103° F.; 10 a. m., 101° ; 12 m., $104\frac{1}{2}^{\circ}$; 2 p. m., $103\frac{1}{2}^{\circ}$; 3:45 p. m., $105\frac{1}{2}^{\circ}$; 5:30 p. m., $104\frac{1}{2}^{\circ}$; 10 p. m., 101° ; midnight, 101° .

The pulse was rapid. The only treatment besides the warm douching of the ear consisted in the administration of small doses of phenacetine which always brought down the temperature at the time.

Dr. John L. Adams examined the fundus of each eye to-day and found a hyperemic condition of both discs, the same on each side. There has been some deafness, but this has been considerably improved by Politzer inflation occasionally.

I saw the patient the following day and went with my assistant, Dr. Hewitt, all prepared to do a further operation and force a passage through the antrum into the middle ear, but deferred the operation as the temperature had been a little lower during the day. 10 a. m., temperature 101° F.; noon, $100\frac{1}{2}^{\circ}$ F.; 4 p. m., 103° ; 5:15 p. m., $104\frac{1}{2}^{\circ}$; 10 p. m., $104\frac{1}{2}^{\circ}$.

I made a further incision in the upper and posterior wall of the canal, but no pus escaped.

March 14, temperature somewhat lower. At 4:40 a. m., temperature $103\frac{1}{2}^{\circ}$ F.; 8:20 a. m., $100\frac{1}{2}^{\circ}$; 12:30 p. m., $101\frac{1}{2}^{\circ}$; 9 p. m., $101\frac{1}{2}^{\circ}$.

A sticky and tenacious discharge appeared today from the left meatus. Wound over mastoid looks well. The ear was douched frequently with a warm boric acid solution. The highest point reached today by the thermometer was $103\frac{1}{2}^{\circ}$ F., lowest, $100\frac{1}{2}^{\circ}$.

March 15. Child very much better and brighter to-day. There was some pus in the canal, the upper portion of which was still somewhat swollen. No perforation could be detected in the drumhead below the membrana flaccida. 7:30 a. m., temperature 99° F.; 1:30 p. m., $100\frac{3}{8}^{\circ}$; 4 p. m., 100° ; 8:15 p. m., $100\frac{3}{8}^{\circ}$.

March 16. 7:30 a. m., temperature $98\frac{1}{2}^{\circ}$ F.; 12 noon, $98\frac{1}{2}^{\circ}$. Mastoid opening filling up with granulations. Ear still being douched.

March 19. The patient has had no fever since. She is doing nicely. There has been a slight discharge from the ear. A saturated solution of boric acid was ordered to be dropped in the ear several times a day. No perforation can be seen in the membrana tympani, but there is a small granulation attached to the anterior and upper wall of the canal close to the membrana tympani, and there is undoubtedly carious bone and a small sinus leading through. This granulation I touched with nitrate of silver on a probe and insufflated some boric acid powder.

March 31. I saw the patient to-day and found that four molar teeth had been discovered coming through the gums, two on each side, one above and one below. Before this there was not a sign of any teeth. The granulations were cauterized with chromic acid and drops of sulphate of zinc gr. ii $\overline{3}$ i were prescribed.

April 3. Since the last visit the temperature has risen at times to $102\frac{1}{2}^{\circ}$ F. and 103° . There is more or less swelling of the gums.

April 16. It became necessary today to give ether again in order to more thoroughly remove the polypus. This was done with curettes and the bone of the upper and anterior wall was scraped. There is undoubtedly a small sinus here, but it could not be detected with a probe.

May 14. The bare bone was found covered to-day and the canal contains but a few scales. The treatment since the last visit has consisted in cauterizing the base of the polypus with chromic acid, and the instillation of alcohol drops and sulphate of zinc alternated.

June 1. The patient has made an excellent recovery and has gained much in weight and general appearance.

This case seems to me to present several very interesting clinical points. When first seen, it was only by a thorough examination and by pressing over the mastoid by the attending physician that any trouble was located in the ear, as the patient did not complain of any earache at the time. A thorough examination of the child was made and nothing discovered to account for a temperature of 105° F., except the inflammation about the ear.

Although we frequently have more or less fever at the outset of an attack of acute otitis media, it is very seldom, in my experience, that a temperature shows such a curious course. It seemed at the time that there must be a collection of pus somewhere which gave rise to this fluctuation in the temperature. It was suggestive of a septicemic condition, except that there were no rigors, nor chills, nor sweating.

Although the mouth was examined at various times, there was no redness nor swelling of the gums noticed until March 26. It is a well-known fact that an acute otitis media is frequently caused by teething through sympathetic irritation, and there is no doubt but that the cutting of the four molar teeth played a most important part in the unusual course of the temperature.

I think that from the beginning, the disease was probably located in the mastoid antrum, and that subsequently there was a curious condition developed.

Although at the time of the first operation I felt that I had done all that was necessary, as the bone seemed quite healthy, still, in the light of the subsequent history of the case, I regret now that I did not chisel a passage into the antrum and middle ear at the time.

63 west Fifty-fourth street.

THE STATISTICS OF EAR DISEASE.

WITH TABULATION OF 4785 RECENT PATIENTS (5412 DISEASES).

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THE matter of the statistical reports of dispensary and private practice contains many important questions beside the one of nomenclature, which comes over to us from last year. It is surely of great weight that uniformity should so far prevail as to make different reports comparable; yet it takes little inquiry to bring to light that in many an institution there is no consensus of view and statement among the surgeons, and that its report is at variance with itself.

Passing over the generally accepted point that only the new cases shall be given, to the exclusion of all old cases from previous years, in the annual report, the extremely important question meet us, shall we report patients, or diseases, or both? To report only individuals leaves out of count many noteworthy conditions, and gives occasion for false estimates as to their relative frequency; on the other hand, multiple diagnosis may immensely pad out the statistics according to the arbitrary choice of the recorder, with little or no clue to the facts as to individuals. So a double set of figures more than justifies its cumbersomeness. The matter of sex, like that of childhood or maturity, in its bearing upon various diseases, is frequently most worthy of note, as witness many interesting, although inconclusive, studies. In like manner, the question of which side is affected by predilection in certain diseases or of the bilateral occurrence of the lesion, has come into importance of late, and well deserves record and report. The statement of the results of treatment, always a delicate matter, seems more so here than in most lines of medicine; for the surgeon who looks with complacency at semi-anchylosed joints in his own practice, or the physician who would question your sanity if you found fault with the cure of a pleurisy which left adhesions, expects absolutely perfect results of the aurist.

The nomenclature to be employed and the minuteness of the subdivisions of the cases falling under the wider diagnostic heads, need also some unanimity of choice. The Latin names have almost universal use, even among those who rather strive to use the vernacular; so we need only be more precise and consistent in our usage to give a full and ready answer to the first of these questions; the latter will largely solve itself in practice, since every one will feel the limitations as to the complexity of any table which he wishes to have published. Only by detailed case-histories can all the shades of differing, yet similar, cases be set forth; but anything of this sort will find its level in the remark column, in foot-notes or in fuller narration.

The value of careful statistical reports of private and dispensary work in its influence upon the worker himself must be apparent to anyone who considers it. Nothing short of full individual records can be adequate and satisfactory; but too many find the data sadly lacking in their neglected records when anything moves them to a search—omissions which are annoying and hampering when the return of the patient raises questions as to the previous condition and treatment. But far more mortifying are such blanks when one undertakes to set forth his results and finds the numerous and serious gaps. Yet this very mortification, or the fear of it, is one of the best spurs to greater diligence in studying out and recording cases, which might otherwise be irretrievably, though not very decently, buried in our case-books. Hence, patients will probably profit by being treated with better insight at first and with fuller understanding and recollection later, if the worker is conscious that he has a formal account to give of the details of his stewardship; and the surgeon, possessed of objective data as to measures and results in all his cases, will gain more than vague and scattered impressions of what he has found most efficient in his practice. Thus his work should be constantly and positively instructive, and his records will probably indicate increasing success, especially in those directions in which improvement is most important, yet most difficult. The same gain will naturally redound to the advantage of the student, who now looks longingly but vainly at the reports of many large clinics, wishing that he could accept with less skepticism the showings which they present.

The discussion of the statistics of ear disease at the Berlin Congress will probably lead to some action in the coming Congress at Rome; since it made very evident the discrepancies now existing and gave indications of the steps towards their elimination. In his

recent article in Schwartz's handbook, Bürkner has set forth his deliberate judgment as to the details. He holds that diseased conditions should be the basis of report, that age and sex should be noted, and that results should be recorded as "healed" only when the restoration is practically perfect, anatomically and functionally. No rigid line can be rationally drawn to cover fully all cases; but common sense will clearly indicate in the majority of instances what success, can be fairly claimed. Bürkner has utilized such data from his own wide practice and to a less degree from the reports of others; yet the statements thus far made generally leave indefinite many points which might quite readily be explicitly stated. Tabulations are cumbersome and awkward things for publisher and reader; but they can be made very full and valuable with no great increase in their complexity. Several tables may be more convenient for the recording of various phases of the same series of cases; yet a single table can generally be made to show all of this and such of the inter-relations otherwise left unstated.

As an illustration of this, see tabulation on next page of my last four years of practice, giving the figures as to age, sex and ear affected for each of the conditions diagnosticated, as well as the number of individuals, adult and juvenile, grouped according to the diagnosis. The therapeutic results have not been given, because my records are often too imperfect to show them with adequate certainty. In future years it will be easier to use this table almost as a starting point, subdividing its columns so as to show the results of treatment; and by a monthly record therein of every new case and a revision of the records of the preceding month or two, to make this table and the original records upon which it is based, full, reliable and up to date, in a way that is now almost impracticable. Even such a study as the compilation of this table has enforced, has brought into view many a record to which needed additions could still be made from memory or by reason of a recent visit of the patient; and I look for much profit from the review. Thus only can my dispensary services be made as instructive as they should be to myself and others; and I can warmly recommend the method to the notice of my colleagues as abundantly repaying the trouble entailed in such a revision.

TABULAR STATEMENT OF 4785 PATIENTS (5412 DISEASED CONDITIONS) IN 1889-1892.

PERSONÆ		NOMINA MORBORUM	MASCULINI						FEMININÆ						Totals
Adult	Infant.		ADULTI			INFANTES			ADULTE			INFANTES			
			A.D.	A.S.	A.U.	A.D.	A.S.	A.U.	A.D.	A.S.	A.U.	A.D.	A.S.	A.U.	
1	2	Auriculæ helicis, Abscessus.	1	1	1	1	1	1	1	1	1	1	1	1	3
1	1	" " Ambustio	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	" " Congelatio	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	" " Cystoma	1	1	1	1	1	1	1	1	1	1	1	1	1
8	25	" " Deformitas	1	1	1	1	1	17	2	5	1	1	1	15	46
3	3	" " Eczema	1	1	1	1	1	1	2	5	1	1	1	1	3
2	2	" " Epithelioma	2	1	1	1	1	1	1	1	1	1	1	1	2
1	1	" " Erysipelas	1	1	1	1	1	1	1	1	1	1	1	1	3
1	1	" " Hematoma	1	1	1	1	1	1	1	1	1	1	1	1	1
1	2	" " Herpes	1	1	1	1	1	1	1	1	1	1	1	1	3
1	3	" " Microtia	1	1	1	1	1	1	1	1	1	2	1	1	3
1	1	" " Perichondritis	1	1	1	1	1	1	1	1	1	1	1	1	3
1	4	" " Reduplicatio	1	1	1	1	1	2	1	1	1	1	1	1	4
1	1	" " Ulceratio	1	1	1	1	1	1	1	1	1	1	1	1	1
3	9	" lobulæ, Abscessus	3	1	1	1	1	1	1	1	1	1	1	1	12
1	1	" " Fibroma	1	1	1	1	1	1	1	1	1	1	1	1	2
1	1	" " Laceratio	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	Abscessus parauricularis	1	2	1	1	1	1	1	1	1	1	1	1	5
371	140	Meatus, Accumulatio ceruminis.	57	58	154	16	15	39	27	23	74	14	15	45	537
1	1	" " Atrisia	1	1	1	1	1	1	1	1	1	1	1	1	7
1	1	" " Caries	1	1	1	1	1	1	1	1	1	1	1	1	2
6	32	" " Corpus alienum	3	1	4	3	6	3	3	3	8	11	4	4	46
80	11	" " Eczema (O. ext. dif.)	4	13	26	2	9	13	12	8	28	8	1	15	139
1	1	" " Exostosis	1	1	1	1	1	1	1	1	2	1	1	1	5
57	35	" " Furunculosis (O. ext. circ.)	11	10	7	9	9	6	12	15	11	8	9	5	112
4	4	" " Granulatio	1	1	1	1	1	1	1	1	1	1	2	1	5
1	1	" " Hyperostosis	1	1	1	1	1	1	1	1	1	1	1	1	5
1	1	" " Neoplasma	1	1	1	1	1	1	1	1	1	1	1	1	1
5	2	" " Otomycosis	2	1	3	1	1	2	1	1	1	1	1	1	10
1	1	" " Trauma	1	1	1	1	1	1	1	1	1	1	1	1	2
522	271	Totales Auris externæ	86	96	136	38	45	87	57	58	120	48	41	97	969

THE TREATMENT OF TINNITUS IN AURAL SCLEROSIS.

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MUCH has been written within the last few years upon the *operative* treatment of tinnitus aurium occurring as a symptom of chronic aural catarrh, but the literature of less radical measures is but meager.

Yet, in the experience of the writer, there are many methods yielding all the good results which are gained by extensive operations, and which have the immense advantage of being painless and safe.

It is the purpose of the present paper to briefly consider some of the most generally useful of such measures, and to protest against the performance of painful and dangerous operations on cases in which milder measures will secure equally good results.

The therapeutics of "chronic catarrhal tinnitus" of course, includes all measures which may be used to advantage in controlling that never altogether curable disease. Among these, proper treatment of the naso-larynx ranks first, methods directed to the Eustachian tubes next, and immediate local treatment of the tympanum last, in order of efficiency.

Naso-laryngeal therapeutics and the ordinary methods of Politzer's and catheter inflation of the Eustachian tubes are familiar subjects, and do not call for discussion here. The special forms of tubal medication which the writer has found especially useful in tinnitus of catarrhal origin, are oil injections and the direct application of the vapor of menthol to the tubal lining. The oil best suited for the purpose is pure fluid *albolene*, or its chemical equivalent, to which may be added camphor or menthol in the strength of one-half to two grains per ounce. A full-sized Eustachian catheter, a one dram syringe fitting the former on the ground joint principle, and an ordinary catheter inflation bag adapted to the same, are the instruments required. The catheter is introduced in the ordinary way, and firmly fixed in the Eustachian orifice; the syringe is then filled with oil slightly warmed,

fitted to the catheter, and its contents forced into the tube; the syringe is then promptly withdrawn and air inflated through the catheter to gently force the oil further up the tube. The relief to tinnitus, gained by this procedure, is often very great, lasting in some cases for days after a single application. It may be repeated every third or fourth day for a considerable time, and has frequently been known to remove the tinnitus completely for a period of several months, the symptom gradually returning and calling for a repetition of this or some other method of relief. If the oil is warm and sterile, the instruments absolutely clean, and the operator's hands skillful and light, the procedure seems absolutely harmless if repeated not oftener than once in four or five days, and the results obtained are as permanent as those from many far graver methods. The action of the remedy seems to depend on the well-known vascular sedative effect of the medicament used, as well as upon the general mechanical "massaging" and lubricating action of the oil.

Menthol vaporization has been used by the writer for the last year and a half, with excellent results in stopping tinnitus and other aural symptoms dependent on tubal congestion and inflammation. The apparatus generally used is the Dench vapor generator; or for clinic use, a simpler one consisting of a two ounce wide mouth bottle, fitted with a tight rubber cork through which are passed two short L-shaped glass tubes, is employed. Either form of instrument is fitted with two sections of rubber tubing, to one of which is attached an atomizer bulb, and to the other a cone-shaped tip for insertion into an Eustachian catheter. For use, the bottle is half filled with fresh menthol crystals, the catheter is then passed and fixed in the Eustachian tube, the cone tip adjusted, and the bulb compressed, when the vapor, of course, passes through the catheter into the tube, and the characteristic "menthol sensation" is at once experienced by the patient. The compressions may be made continuously for about one minute, or less, if the application should become at all painful.

It is a common experience to at once relieve or stop tinnitus in cases in which simple air inflation has failed to give good results by this treatment; used two or three times per week, in addition, of course, to proper treatment of the naso-pharynx, it has permanently improved the condition of many severe cases, and appears to be a distinct improvement upon older methods.

Among the means resorted to, to directly effect the vascular supply of the tympanum, none has yielded such good results in the

writer's hands as freezing the mastoid region over the branches of the posterior-auricular and stylo-mastoid arteries. Ether and rhigolene sprays were at first used for this purpose, but the former was very slow and cumbersome, the latter highly explosive and difficult to keep, and the writer now uses exclusively the tubes of chloride of ethyl which are furnished for dental operations. The tube being open and held horizontally in the hand, a very fine jet of fluid at once issues from its tip, which is to be directed on the mastoid region until the skin is frozen white over the whole area. Deep freezing is neither necessary nor desirable, an effect so superficial as to be perfectly safe being quite sufficient. Of course, reasonable precautions against the patients taking cold or the production of frost bite are requisite. The freezing may be repeated in a few days if required, but frequently a single use of the method will arrest tinnitus completely for a longer period. Its cautious, repeated use, seldom fails to at least ameliorate the most distressing aural noises, and a certain proportion of cases experience such a high degree of relief that a symptomatic cure may be claimed. It should be clearly understood that the method is advocated only in the tinnitus of sclerotic otitis, and where the usual methods have failed to benefit; the existence of active inflammation is always an absolute contra-indication. The beneficial result of this method of treatment doubtless depends entirely on the nervous influence; the vaso-motor effect of freezing procedures, and that surface-freezing lessens the conductivity of nerves and profoundly affects nerve centers, being well known.

The operations for the relief of tinnitus which have been of late years suggested are very numerous, and the results claimed for nearly all of them have been most brilliant. Especially has excision of the auditory ossicles been lauded as a cureall for the graver forms of ear noises occurring in sclerosis. Early in the history of the operation the malleus was usually alone removed, later the incus was excised; at present, the usual procedure is to remove the stapes, or at least its cura, allowing the larger bones to remain in situ. A careful study of recent literature on the subject can hardly fail to leave an unprejudiced reader with the idea that many of the operations reported were hopelessly haphazard, and that all that seems absolutely necessary is to remove some part of the ossicular chain to secure the most brilliant (!) results.

The fact is, that almost any operation whatever performed upon an ear which is the seat of catarrhal tinnitus, will stop or relieve the noises for a longer or shorter time, but it is equally certain that

the sounds are almost sure to return, often in a more aggravated and necessarily hopeless form.

While the relief to tension gained by a scientific ossicular excision may permanently relieve tinnitus in a very few cases, as a definite curative procedure it must be regarded with grave doubts in sclerotic cases, and in the writer's opinion, should never be performed except as a very last resort, and then must be regarded largely as an experiment.

Almost the only operation now performed by the writer for the relief of this symptom in catarrhal cases is mobilization of the ossicles; the principle of the Siegle masseur being supplemented by mechanical force, and the ossicles liberated to a greater or less extent. The method has the advantage of nearly perfect safety, comparative painlessness, and can be performed several times upon the same ear without injury. It rarely fails to relieve subjective noises for at least as long a time as the most radical excisions, and as it practically leaves the ear in the same condition as before the operation, it can be repeated in a year, or less, if necessary. Several very chronic cases have been greatly relieved for more than a year after its performance, supplemented by the usual naso-pharyngeal and tubal treatment.

The therapeutics of tinnitus aurium by drugs internally administered, offers but little encouragement in fibro-blastic catarrh; bromides and their derivatives, iodides, pilocarpine, etc., etc., do certainly relieve a few patients, but their continued use is very undesirable, and the good effects are soon lost. Their use has been almost altogether abandoned by the writer, or relegated to a few cases in which some other condition seemed to have as much to do with the noises as the aural lesions.

Chronic sclerotic otitis is essentially as incurable a disease today as it was twenty years ago; the slow, insidious fibroid changes tend to progress, no matter what be done, and the inevitable effect of irritating methods of treatment, no matter what their first results may be, must be to increase the fibro-blastic changes and hurry the patient on to hopeless deafness and incurable tinnitus. But by the employment of proper means, a few of which have been suggested, the process may be arrested in some cases for many years; and in nearly all, much may be done to lessen the patient's discomfort, of no form of which do cases of sclerotic otitis so bitterly complain as of tinnitus aurium.

213 South Seventeenth Street.

A CASE OF MYXO-SARCOMA.

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DURING the early part of October, 1892, there came under my observation a child, aged 5, presenting quite an interesting clinical history. This child had previously been under the care of Dr. Bayne, who referred him to me. The patient was born to parents of unusually good health, and free from any hereditary physical defects or vice. The child was strong and apparently in perfect health until the end of his second year. At this time, his parents noticed that he "sniffled," and that his nasal breathing was somewhat impaired. This difficult nasal breathing became slowly but progressively worse, and was followed by a train of symptoms due to imperfect nasal respiration. He became restless at night; snored and caught his breath; would wake up crying as though frightened; breathe with his mouth open; and on awakening in the morning, would be cross and irritable. About six months before coming under my care, the parents noticed that his voice was muffled and had lost nearly all its nasal quality. The child now began to lose flesh, showing but a slight desire for food. About this time, a growth developed upon right side of neck, and it was also observed that something was protruding from the left nasal cavity. Discharge from nasal cavity was thin and watery, never sanious, nor was there ever any free bleeding. Shortly before consulting Dr. Bayne, dysphagia was added to the child's already pitiable condition. At this time, the inability to ingest food was confined to solids, liquids being taken with some degree of ease. Dr. Bayne removed the mass protruding from the nose and then referred the parents to me.

On presentation, he was noted to be a well formed boy of average height; body and face extremely emaciated; nasal breathing entirely annulled, oral breathing distressingly loud and unpleasant. He was very weak; voice almost absent and unintelligible; was drowsy, and if held quiet for a few moments, passed into a deep sleep. Externally his nose was well formed and showed no deformity. On the right side of neck there was a tumor of about three centimeters in diameter. The mother stated that for about three days the child had found it almost impossible to ingest food, either liquid or solid, and she feared that he would starve if something were not done immediately. I found her statement to be absolutely correct as the child could not swallow water when offered. Both nasal cavities were filled with a grayish white mass which protruded slightly. The mouth was in a horribly offensive condition; the lips were fissured and covered with dry crusts and the teeth with sordes. The tongue was dry, horny, and

deeply congested along its free borders. The hard palate was covered with a dark brown deposit, and the soft palate pushed forward until the uvula rested on the center of the dorsum of the tongue. The whole pharynx was filled up with a dirty grayish white mass that extended well into the mouth. This mass was more or less lobulated, and its lower borders were hornified. I appointed the next day for operation.

Suspecting the growth was malignant, I prepared for considerable hemorrhage. I operated without the use of an anesthetic; Dr. Balloch assisted me. I removed the mass from the nose, first with the cold snare, attended with only moderate bleeding. The pharynx was cleared with the finger and post-nasal forceps. The hemorrhage from the whole operation was much less than ordinarily attends the removal of post-adenoid hypertrophies.

The child was greatly improved by the operation, and gained strength and flesh very rapidly. On the fourth day after the operation, I observed a large mass of mottled grayish black tissue in the left nasal cavity, which I removed with the snare. This mass was slightly necrotic and I thought it was a piece that I detached and failed to remove during my first operation. Four days later, on the child reporting, I found the cavity again filled out with a mass similar to the one removed at the previous sitting. This mass was about three centimeters long by about one centimeter in diameter; softer and more pultaceous than the first tissue removed. Bleeding was also more active. I was now firmly convinced that the growth was a myxo-sarcoma. In four days, there was a greater reproduction, extending even into the pharynx. On this day, Dr. Balloch confirmed my diagnosis by telling me that the tissue originally removed was from a myxo-sarcoma. I now consulted with Dr. Bayne as to the advisability of doing a more formidable operation. The excision of the superior maxilla met with his approval and the day appointed for its removal. The child's condition on the day of the operation, although only six days since my last interference, was quite as bad as previous to any operative interference whatever. The attachment of this growth seemed to be about midway of the under surface of the middle turbinated bone. With the assistance of Drs. Bayne, Van-Rensselaer and Luce, I did Billroth's operation for resection of the superior maxilla. Chloroform was administered. An incision was made from the root of the nose, extending in the median line to its tip, through the soft tissues and into the nasal cavity, upon the side to be operated upon. From the root of the nose, an incision was carried outward to the malar prominence. In making this latter incision, care was taken in carrying the knife along the margin of the orbit, to avoid the infra-orbital foramen from fear of dividing the artery issuing from this canal and thereby cause troublesome hemorrhage. An incision parallel to the second incision was carried from the ala of the left nasal cavity to the border of the masseter muscle. The nasal bones were now disarticulated and the flap containing the left nasal bone was rapidly separated from the left maxilla and thrown outward. Bleeding vessels were taken up as divided, and consequently only a very slight amount of blood was lost. The whole nasal cavity was now exposed, and filling out this space was seen the same character of growth that had been so often removed. The growth was traced under the middle turbinated bone, from whence it seemed to have its origin by a broad base. The body of the superior maxilla was now separated by sawing outward, in

the lines of the skin incisions, and after the mass had been separated, it was pried out of its position and turned outward upon the cheek. As the growth now could be seen to involve the antrum, probably secondarily rather than primarily, I decided to remove the bony mass entirely, and therefore separated it from the pterygoid process. A part of the palate bone and the pterygoid process were torn away by forceps. The whole cavity was now free of growth. Rough edges were curetted away and the cavity having been packed with iodoform gauze, the skin flap was brought into position and carefully united. Hemorrhage was quite free, but to no alarming degree. The patient bore the operation well and rapidly recovered from the shock. There was no bleeding after reaction set in. The patient was in good spirits and quite hungry the next morning; had no fever. On the fourth day, the iodoform dressing was removed, coming away quite clean, and new gauze introduced. On the fifth day, all stitches were removed and union found to be perfect. On the seventh day, the gauze was finally removed. There was no fever throughout. There was only a slight difference to be noticed in the prominence of the two sides of the face. At the end of the third week, as the child seemed to be in a perfect condition, I discontinued my visits. Five weeks later, the mother requested me to see the child on account of the rapid increase in size of the tumor on the right side of the neck, and if possible, to relieve the child from the great pain that this rapid increase in size had occasioned. The growth had now assumed enormous proportions and filled out the whole right cervical region, extending from the mastoid to the clavicle. I also noticed a smaller growth, on the left side, just above the clavicle. During the following week, new growths appeared in lateral walls of the pharynx and in left cervical region; there was no recurrence in nasal cavity.

Four months after the operation, the child died from inanition and exhaustion.

In looking over the histories of some sixty cases of nasal and naso-pharyngeal sarcomata, many of the latter, no doubt, having their origin in the nasal cavity, I find several that correspond in their description very much to the case above given. In these extensive growths I find that the patients were quite young, but none so young as the case here presented. Rapid reproduction is common in sarcomatous tissue, but the rapidity of regrowth in this case was of a startling nature. To have all evidences of a growth removed in one day and within six days thereafter to have it nearly reproduced in its original magnitude is sufficient to excite the admiration of any pathologist. We have all been taught that hemorrhage is quite a necessary attendant upon malignancy, especially is this stated in regard to sarcoma. It therefore appeared to me to be quite remarkable that this little one had had no trouble of this character, and that the various operative procedures were attended with so little bleeding. The micro-pathological find was that of a most typical and exquisite myxo-sarcoma. Disseminated

throughout this mass of tissue were single fibers of striated muscular tissue. The section which showed these muscular fibers in the most pronounced manner was obtained from a mass removed from the nasal cavity.

There are several points in connection with the operative interference that require consideration. In a case of this character where operative interference was not so immediately demanded to relieve the urgent symptoms, I think it would be wise to first ascertain the character of the growth before resorting to any instrumental interference. It seems that all interference, excepting that it be of radical character, intensifies the rapidity of growth and its malignancy. One well knowing the nature of the growth, they can consider, from its seat and attachment, whether it is possible to remove in its entirety and more thoroughly by the snare, or whether it will be necessary to resort to one of the more formidable operations. Growths so extensive as the one outlined above should, if any operation is attempted, be dealt with in a most liberal manner. The reason the above case was not so treated at first was on account of the desperate condition of the child and the necessity for immediate action. A positive diagnosis could not be made out from its clinical history alone. It is also a question whether even the latter operation would have benefitted this patient, as no doubt a general sarcomatous infiltration had already set in when he was first brought under my observation.

1102 L street.

A CASE OF TRAUMATIC EPILEPSY RELIEVED BY OPERATION ON THE NOSE.

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ANYTHING bearing on the question of the etiology of epilepsy, or adding to the testimony that it is, in many instances at least, a disease of local origin, due to some form of irritation, cannot help but be interesting. The following case which came under my care at the Manhattan Eye and Ear Hospital is accordingly reported:

Charles S., aged 16, presented himself at the hospital May 29, 1893. He was a poorly nourished child, showing plain evidences of close confinement. Family history absolutely negative, no trace of epilepsy to be detected. Questioning the mother closely, elicited the following history:

As a child he was never very healthy, though never seriously sick. In July, 1892, while playing ball, was struck by a baseball bat in the face, causing a fracture of the nose, as the family physician informed her. Previous to this accident child had frequently injured his nose by falling. On February 17, 1893, while at work, child was seized by an epileptic attack lasting some fifteen minutes. A second attack followed two days later, seen by the mother, in which there was a general convulsive movement of the hands and feet, biting the lips, and entire unconsciousness. The next day there were three attacks, and again during the last of March. During April and May, attacks came at irregular intervals in spite of medicine given by the local physician.

On his first appearance at the hospital, child presented all the appearance of a mouth-breather; examination of nose revealed a septum so far deviated to right, that all breathing in the right nostril was cut off. The cartilagenous septum was particularly dislocated, but in addition, the vomer had been fractured, and with the perpendicular plate of the ethmoid was much distorted and greatly thickened on the right side.

It was decided, as a preliminary step to the correction of the deviation, that the prominent bony spur jutting out into the right inferior meatus be removed. This was done by my colleague, Dr. Dwight L. Hubbard, under cocaine, by means of a Curtis saw. The mother states that there was one attack shortly following the operation. On June 19, the boy was placed

under ether, and the septum thoroughly broken up by means of Adam's forceps, and a Behren's perforated cork splint introduced. The child experienced immediate relief in his breathing. I was unable to see him but once or twice after the operation, and on my return from a short vacation, found that the septum had gone back to almost its original deformity. This necessitated putting the child a second time under ether on September 27, and again breaking up the bony septum. This time the wound healed nicely.

At the date of this writing, November 11, there has been no return of any epileptic seizure; there is good breathing in the right nostril, and parents and child are equally delighted with the result.

In connection with this case it will be of interest to compare a somewhat similar case reported by Dr. S. Weir Mitchell, (*Am. Jour. Med. Sciences*, 1889).

A very careful examination of the current literature reveals an astonishing number of cases of epilepsy of reflex origin relieved by operation in other portions of the body. Among them, several where the removal of impacted cerumen in the outer ear has entirely done away with all symptoms. We were unable, however, to find but this solitary case of Dr. Mitchell's, and the report by Dr. DeVilbis, Ind., (*St. Louis Med. and Surg. Jour.*, 1884) of three cases of nasal catarrh with conjoined epilepsy in which the epilepsy was cured in one case, and much relieved in the two remaining by proper attention to the nasal trouble. As Dr. DeVilbis very truly remarks, "an irritation of almost any part of the body except the nasal cavities has been said by authorities to produce it, (epilepsy), and, if so, why not an irritation of cavities so closely connected to the great center of the nervous system."

The case of Dr. Mitchell was "a girl aged 17, who was afflicted with epilepsy. The girl was of a weak mind and attributed the attacks to a fall on the head. An examination revealed that she had a purulent discharge from the left nostril. In the effort to treat this it was discovered that that side of the nose was completely occluded by a foreign body. This was extracted piece by piece, and was found to be a bean, which, in foolish play, had been pushed up the nose and lodged there. It had, at one time, begun to sprout, but the growth had manifestly been arrested by circumstances unfavorable to its increase. The removal of the bean, and the washing out of the nostril with proper astringent solutions, resulted in a complete cure of the fits. The attacks were most positively of epileptic nature, and had nothing about them of a hysterical quality."

Both this case and the one the subject of this paper, show plainly irritation as the cause of the attacks. In the case of Chas. S., the absolutely negative family history; his entire freedom from anything approaching an attack, up to the time of the receiving the injury to his nose, the marked deformity caused by the fracture, with the almost immediate relief on the correction of the obstruc-

tion, seems to furnish conclusive proof as to trauma being the cause of this case. It might be said further, that there was not the slightest sign of any hysterical condition from first to last. How the accident acted to induce the attacks, whether directly (it seemed certain that the ethmoid had received a severe injury), or indirectly, by reflex action as in Dr. Mitchell's case, we cannot say, nor would we speak too emphatically regarding any return of the attack at a subsequent period. At present, however, it looks as if he were permanently relieved.

117 East Fortieth street.

TONSILLITHS.

BY WALTER B. JOHNSON, M. D.,
OF PATERSON, N. J.

THE case here reported of calcareous deposits in the tonsils is both interesting and instructive. The condition has been described as "stone in the throat," "gravel of the tonsils," etc., but is now universally termed "tonsilliths."

J. M. B., aged 65. A strong, healthy man, full-blooded, and of rather active habit, weight 160 pounds, has had some muscular rheumatism and three attacks of gout, the last about one year ago; he never had any chalky concretions or enlargements about the joints.

He first had throat trouble when a boy, he remembers expectorating small formations, which he describes as small, odorous particles; in 1850 he had a severe attack of inflammatory tonsillitis, and since then has suffered more or less from throat trouble each winter.

During the past winter he has had decidedly more trouble with his throat than usual, and he has continuously used an atomizer without receiving any appreciable benefit. On August 20, 1893, while coughing, he found a small particle of a hard material in his mouth, it was about the size of a pea; the cough was immediately followed by the expectoration of an ounce or two of blood, and there was more or less blood in all the sputa for the next three days.

August 23, he discharged another similar concretion which was the size of a very large pea, and, immediately following this, coughed and spit up several ounces of blood; during the next five days the sputa was always streaked with blood, and on two occasions, in the morning, slight hemorrhages occurred.

August 28, the concretion, when examined, was found to be very hard and dense, grayish white in color, rough on the exterior, and irregular in shape.

Examination of the throat disclosed a chronic inflammation of each tonsil and considerable hypertrophic changes, many of the tonsillar crypts were dilated and contained masses of cheesy deposit, and there were some small concretions, similar to those already described, on each of the tonsils; there was no acute inflammation and no severe softness about the fauces.

The spontaneous expulsion of the concretions undoubtedly resulted from coughing while clearing his throat in the morning, the catarrhal condition which was constantly present causing him to habitually clear the throat.

The hemorrhages, which occurred with the expulsion of each tonsillith were, it is believed, unusually severe, and undoubtedly due to the removal of the roughened concretions from the hypertrophied, hyperemic tissue.

August 30, several small concretions about the size of a mustard seed and very hard, and also a number of cheesy masses were removed from the dilated tonsilar crypts with the forceps; the procedure was followed by a slight hemorrhage, and the sputa was tinged with blood for the next two days, after which time the tonsils assumed their normal condition, and the patient concluded that he was sufficiently comfortable to abstain from further treatment, and he has lately reported that he was having much less trouble with his throat than usual.

The case is interesting in consequence of the rarity of the condition; while the presence of the cheesy deposits in the dilated crypts favor calcareous formations and act as a nucleus for them, and the hyperemic condition of the tonsil attending the catarrhal inflammation constantly keeps up the increased blood-supply which is conducive to the deposit of carbonate and phosphate of lime salts.

The constant pressure to which the parts are subjected during the acts of deglutition, hawking and coughing, cause so frequent an expulsion of the cheesy deposits that they do not remain sufficiently long in the tonsilar crypts to form a nucleus for these calcareous deposits.

The case was peculiar in consequence of the presence of so severe a hemorrhage on each occasion of the time of the expulsion of the concretion, and in its continuance for so long a period after, also in the absence of severe inflammatory symptoms during the attack, although his throat was in a considerably more uncomfortable condition than was usual, and he suffered from increased cough.

There was no difficulty in deglutition, nor dyspnœa, and the surrounding parts were not specially affected by any extension of the inflammation.

170 Broadway.

THE TOXIC AMBLYOPIAS; THEIR SYMPTOMS, VARIETIES, PATHOLOGY AND TREATMENT.

BY CASEY A. WOOD, C. M., M. D.,
OF CHICAGO.

(Continued from Vol. II, page 237.)

SYMPTOMS, DIAGNOSIS AND PROGNOSIS. TOBACCO. ALCOHOL.
TOBACCO AND ALCOHOL. QUININE. IODOFORM.
CARBON DISULPHIDE.

BRAUCHLI (76) from 39,428 patients of Prof. Haab's klinik in Zurich, gives the following interesting facts: One hundred and forty-four cases (0.365%) were certainly due to tobacco and alcohol, alone and combined. Ninety-five were due to alcohol and tobacco; in only two of sixteen cases attributed to alcohol was the use of tobacco excluded; in no instance were the so-called pure tobacco cases free from suspicion of indulgence in alcohol. As predisposing causes of the amblyopic symptoms, were mentioned typhoid fever, malaria, loss of blood, syphilis, toothache, and irregular habits of life. Most of the patients were between 36 and 55. Visual disturbances were generally the same in both eyes. In eighty cases there were central color scotomata, and in ten complete red blindness. In the majority of instances there was distinct decoloration of the temporal half of the papilla. Only eighteen per cent were cured; thirty-seven per cent improved; and unsatisfactory, the large amount of forty-four per cent.

J. Hutchinson, Jr., (77) in reporting certain exceptions to the usual symptoms in A. T. amblyopia, gives the following example of a rare form of the disease, a unilateral affection of sight:

G. W., aged 42, came in April, 1884, regarding his right eye. V., R. = $\frac{20}{20}$, and J. x. V., L. = $\frac{20}{20}$ and J. i. Smoked one-half ounce "shag" daily, but no suspicion was held at the time that his amaurosis was due to this cause. His vision deteriorated, until in September, 1884, his left eye also failed. January, 1885, V., R. = $\frac{20}{20}$, J. xix at 7". V., L. = $\frac{20}{20}$, J. xvi at 7". Fundi both normal and fields for white good. There were the usual scotomata for red and green, none for blue or yellow. No sugar or albumin in urine. Avoided "shag" but continued to smoke lighter tobacco, and under treatment improved, and finally recovered good vision in both eyes,

This writer also notes the following exceptional points about some cases of A. T. amblyopia he has met with: 1. Not uncommonly a central scotoma for yellow, with or without some limitation of the color field. 2. Very rarely blue shows a central scotoma, *i. e.*, red, green, yellow, and blue are all confused or mistaken in the central part of the field. 3. The amaurosis may for a considerable time be confined to one eye only. 4. With the central scotomata and great defect of distant vision, good near vision may be retained. 5. The color scotoma, may, at any rate for a time, be wholly absent. 6. Even mild kinds of tobacco may produce amblyopia.

Before leaving this subject, I would direct the reader to an article by Coursserant (78) on the employment of injections of pilocarpine in the diagnosis of the amblyopia from tobacco-alcohol. Speaking of the value of the drug in diagnosis, he claims that immediately after the sweating, salivation, and other signs of increased secretion and excretion had set in, a decided increase of the visual acuity, lasting at least twenty-four hours, will be noticed in cases of toxic amblyopia. Furthermore, where optic pallor is present, the sight does not improve after injections if the decoloration be symptomatic of a true atrophy; indeed, Coursserant has witnessed a continuous and oftentimes a rapid deterioration of vision when the pilocarpine treatment is employed in the non-toxic cases. This test, which resembles that with amyl nitrite, does not, like it, depend for its action upon the temporary flushing of the opticus capillaries, but upon the powerful, if transitory, elimination of the poisonous alcohol and tobacco from the system.

It is as if the circulation in, and nutrition of, the central centers so improved that the poisonous load could be temporarily lifted, and the visual act, while the bettered condition lasted, be performed with greater ease. Such an improvement could not, of course, be expected when the visual centers or opticus elements themselves had been destroyed by disease.

The case for the retro-bulbar neuritis of A. T. amblyopia, as opposed to other forms of optic nerve atrophy, rests upon its distinctive signs and symptoms just related. These form such a constant, such a classic series, that when an unusual condition presents itself it must be regarded as *probably of foreign origin*. To this category, I would consign the inequality of the pupils (2.5%); Argyle-Robertson pupil (1%); dilatation of the pupils (6%); reported by Uhthoff. As for the cases of conjunctival xerosis, uniform pallor of the disc, hyperemia of the papilla, and nystag-

mus, mentioned by Uhthoff and others, they may be classed with the "toxic hysteria" of Gilbert (79) as, at least, of doubtful origin. In this list it would not, perhaps, be fair to include paresis of the ocular muscles. These may set in as the result of an atrophy of their nerve supply. Such cases are merely examples of the peripheral neuritis of advanced alcoholism that may effect the peripheral nerves in *any* part of the body. Among the thousand cases of chronic alcoholism, examined by Uhthoff, muscular anomalies were not uncommon, about 2 per cent, omitting two cases of nystagmus.

Thomsen (80) has described three cases of acute alcoholic paresis affecting the ocular muscles, one of whom recovered.

Suckling (81) reports such a case, of a male patient, aged 50, who had an oculo-motor paresis. He was first attacked with painful cramps in both legs, followed by bilateral paralysis of the rectus inferior and internus, associated with ptosis on both sides. The pupils were contracted and barely reacted to light. No patellar tender reflex, plantar reflex exaggerated. The posterior tibial nerve was tender on pressure. Patient's intellect weakened. Abstinence from alcohol brought about a cure of the ocular paresis.

The *prognosis* is very favorable, especially in those cases where abstinence from the toxic agent is insisted upon and persistently practiced, where the general health is not impaired beyond restoration, where there is no other optic nerve trouble, where the visual field for white is not contracted either peripherally or centrally, where (with all manifest refractive errors corrected) vision does not fall below $\frac{2}{200}$, and where the media are clear, sight can, in the great majority of cases, be restored by judicious treatment in from four to ten weeks.

Caeteris paribus, the length of time occupied in successfully treating a case of tobacco or alcohol amblyopia will depend upon the time his bad vision has lasted, *i. e.*, upon the extent of the ravages which the interstitial neuritis has made among the sensitive macular fibers of the opticus.

But a patient may be practically blind for years, and yet recover.

Over two years ago, a farmer, aged 53, presented himself to me for treatment. He had not been able to read a newspaper for six years. Much of his time had been consumed in going about the country in search of glasses, and although each optician that saw him advised him to consult an oculist, he doggedly refused to do so, having in mind some friend whose eyes had been "ruined by having them tampered with by eye doctors." His was a well marked tobacco amblyopia. He returned home the day I

saw him armed with a large bottle of syrup of hypophosphites, having given me a conditional promise to reform his habits, and to return in the near future. A year afterwards he sent me a note by a neighbor, who also came to consult me, saying that he was all right now, could read as well as he ever did, and thought of beginning to smoke again in moderation.

QUININE.—To the collection made by Atkinson (82) in 1889, most of the published cases of quinine amaurosis, and to the remarks accompanying the report, there is very little to add so far as the diagnosis and prognosis of this form of toxemia is concerned. The first published case of quinine amaurosis, by Giacomini (83) in 1841, as well as of thirteen other cases recorded by Lewis (84), McLean (85), Baldwin (86), Trousseau (87), Guersant (88), and Briquet (89), are anterior to (26) Von Graefe's cases (1857), previously referred to by me as the first on record. I have taken the liberty of quoting extensively from Atkinson's admirable compilation, and am indebted to him for several references.

The original investigations of DeSchweinitz (90), (to be afterwards considered), regarding the pathology of ocular cinchonism were published at a later date, and with Atkinson's review, comprise, practically, all that we know about that affection. From these two sources the English reader may obtain a complete knowledge of the subject as it stands to-day.

The signs and symptoms of quinine amaurosis do not vary greatly. Knapp (91) addressing the Heidelberg Ophthalmological Society, 1881, stated them as follows: "Marked pallor, general weakness, twitching of the mouth and extremities, *total blindness*, and deafness associated with loud *tinnitus aurium*." The pupils are widely dilated and do not react to light, but may to accommodation. The patient often loses consciousness to a greater or less degree, and it may be that the blindness and deafness are not noticed for several days because of the mental condition present. The ophthalmoscope shows *an absolute anemia of the optic nerve and retina. The papilla is chalky-white and no trace of a blood vessel in that or the retina is to be seen.* This state of things is to be seen in *every case*."

Atkinson thinks the eye signs of quinine amaurosis constitute a symptom-complex, as follows: "1. Transitory blindness, complete or incomplete, usually developing suddenly. This blindness may be more complete than in any other recoverable condition, and is comparable to the blindness of atrophy. 2. Color blindness. As sight begins to return, most cases will be found to be color blind, completely or partially. The color sense gradually returns and may ultimately become restored. In some cases the

diminution of light sense is permanent. 3. Wide dilation of the pupils. The pupils are irresponsive to light, but are said to respond to accommodation effort. It is to be inferred that the dilation is due to the blindness, and that there is no implication of the third or sympathetic nerves. 4. There is pallor of the optic discs and extreme diminution of the retina vessels, both veins and arteries. In many cases this is permanent. In cases examined early by the ophthalmoscope, a whitish haze, with cherry-colored spots, has been observed at the macula, as in cases of embolism. [Browne (92), Buller (93), Gruening (94)]. 5. There is contraction of the visual field. This is extreme and expands slowly. There is no reliable evidence that it ever regains its normal extent. "The contraction is concentrical or elliptical with the longest axis in the horizontal direction." Knapp (95). *Impairment of hearing (at times to total deafness), with tinnitus, appears to be present almost invariably.* It is rarely complete more than twenty-four hours and gradually disappears. Some variations from this type have been noted. Voorhies' (22) patient had anesthesia of the cornea. Diez (96), Knapp, and Browne observed divergent strabismus. One of Roosa's cases (97) had marked nystagmus; likewise one of Knapp's. Dickinson (98) noted in his patient "marked congestion of the retinal and choroidal vessels, together with a remarkable tumefaction of the optic disc, it appearing swollen and pushed forward prominently into the vitreous. Its condition was very similar to that denominated '*staunungs-papille*,' (choked disc), the usual concomitant or resultant of neuro-retinitis." This is a striking variation from the otherwise universal experience, and it may not be impossible that the symptoms in this case were expressions of malarial intoxication, such as are occasionally observed.

"Taken altogether, the symptoms of quinine amaurosis are strikingly definite and constant. Knapp's first case appears to show that relapse may be excited by quite small doses. One of Nettle-ship's patients (99) exhibited the predisposing idiosyncrasy in its extremest degree, his sight being seriously damaged by twenty-three grains of quinine administered during three days, two years after he had been similarly affected by quinine."

Rogers (100) thinks that *incomplete ocular cinchonism* is not rare, and asserts that an hour after twenty grains of quinine have been taken some accommodative paresis may be noticed in a goodly percentage of the cases; that at the end of the second hour it is complete, so that a No. 10 convex glass (+ 4. D?) is required to enable the patient to read at the usual near point.

This paresis lasts eight to ten hours. The greater number of incomplete ocular cinchonism escapes observation or record.

"Briquet (89) who saw four such cases, thus describes the evolution of the symptoms. Says this writer, the patient begins to complain of the light, and the effort to fix the eye upon objects is painful. There is a sensation like that produced by using strong glasses. The eye is brilliant. The pupils are usually normal and the conjunctiva not injected. There is then a slight degree of excitation of the optic nerve, analogous to that so often seen in the beginning of paralysis of the nerve. In a more advanced degree, patients see as through a mist. Objects seem small or double, or are not perceived at a distance of two or three meters. Finally, incomplete amaurosis may occur when the pupils become dilated and insensible to light."

Briquet quotes Monneret as also having seen four cases of this incomplete amaurosis.

"In most cases the blindness develops suddenly. More than once it has been described as occurring 'just as if a lamp had been blown out.' In many cases, however, vision fails much more gradually. Blindness generally becomes complete within twenty-four hours, though in some cases several days may elapse before this occurs. The duration of total blindness, the absence of all perception of light, varies within wide limits from a few hours [Peschl (101), Webster (102), et. al.] to a day or more; [Briquet, Baldwin (86), Buller, Gruening, et. al.] to several weeks, even many; three, Gruening; five, Michel (103); ten, Voorhies; nearly three months, Dewey (104). In most cases, perception of light returns within a few days. There is no case recorded where blindness remained absolute. In all sight was recovered, though often slowly, and nearly always imperfectly. Six months after the beginning of blindness, one of Gruening's cases was still partially color-blind, and the fields of vision remained contracted. During the greater part of the first year, one of McLean's patients could look steadily at the sun without seeing it or even without any painful sensation being produced. In one of Roosa's cases the visual fields remained contracted, the optic discs pale, and the arteries small. In another, the patient whose vision was said to have been perfectly normal previously, felt, after two years, as if there had been a veil over the eyes, and she could not tell if her linen was clean as it came from the wash. She was also unable to distinguish certain shades of dark blue. In Voorhies' patient the optic discs remained perfectly white after nearly a year, and there was

no trace of the central artery, except a small twig. The visual field was greatly contracted after an interval of twenty-two months. Buller found in his patient a total abolition of all sense of color, except by central perception. Central vision was perfect. The nerves were both pale, but not white. The arteries and veins were not one-third as large as normal. Webster reported a case, where, seven years after the beginning of blindness, which was total only a few hours, the sight remained impaired. Browne states that in one case the visual field remained contracted after fifteen years. In nearly every case where the condition of the sight was accurately determined, some damage to vision remained when the patient was last observed. As regards peripheral vision, the blindness remains permanent. Central vision gradually returns to the normal after some days, weeks, or months. (Gruening)."

As rare exceptions to the very definite symptom-complex of quinine amaurosis, is a case reported by Jodko,¹ in which there were central scotomata, but no fundus changes. H. C. Coe (105) records a case in which internal strabismus, with slight ptosis, was produced by five grains of quinine taken four times a day for five days. Patient recovered.

Some unusual eye symptoms are noticed by Mellinger (106), and by Emile Roger (107), but they may be regarded—like the above—as quite exceptional, if not accidental.

The *prognosis*, so far as sight is spoken of in the sense of central vision, is very favorable. Where an embolic process is the pathological condition present, damage to peripheral vision is, in the nature of things, likely to persist. But there are few ocular conditions, and certainly no other toxic states in which a patient is so certain, after a total blindness, to recover in so short a space of time such good and useful vision as can confidently be looked for in quinine amaurosis.

IODOFORM. In addition to the case of iodoform amblyopia, published by Hirschberg (17), and detailed in a former chapter, E. Hutchinson (108) and Priestly Smith (109), have more recently furnished us with interesting histories of two others. The latter writer confirms the propriety of placing this drug in Class I, Division 1, and gives us the following history:

H. B., aged 31, was admitted to Queen's Hospital with a disease diagnosed as tubercular pleurisy and peritonitis. For forty-one days he was given two grains of iodoform three times a day, the dose being increased

¹ Quoted by Uhthoff, *loc. cit.*

during the last ten days of treatment to four grains eight times, or thirty-two grains per diem. After thus taking 1,000 grains, he experienced the general poisonous effects of the drug—faintness, diarrhœa, twitching of hands, constant taste and smell of iodoform, etc. On the third day, after stopping the remedy, there was great drowsiness and ptosis; the latter symptom disappearing the next day. On the fourth day, refraction was found to be normal, and the media clear; haziness of the disc, but no papillitis; vision greatly impaired, and an absolute central scotoma, Red scotoma as in tobacco A., but larger. Loss of vision began two days before stopping the drug and rapidly increased. Three days afterwards the papilla more hazy. Four weeks later patient had still a central color scotoma in both eyes; absolute just below the fixation point. V., R. = $\frac{5}{30}$, V., L. = $\frac{5}{30}$. Vision rapidly improved, and in three months was $\frac{8}{20}$ n. o., and no scotomata. The patient did not smoke during his stay in the hospital, but began in moderation while undergoing outside treatment.

Nothing is said about this man's habits as to indulgence in alcohol.

E. Hutchinson reports his case as follows: E. G., merchant, age not stated, non-smoker and temperate user of wine, consulted Dr. Hutchinson in February, 1885, for visual failure beginning at previous Christmas holidays. He got rapidly worse, and at time of examination V. = $\frac{1}{10}$ in either eye. Color perception and visual field normal. No pain in eyes. Fundus normal, except that discs were gray. He had been taking six grains of cresote and nine grains of iodoform in pill form since January, 1884, more than a year. The iodoform in the pills were stopped, and hypodermic injections of strychnine gr. $\frac{1}{10}$ daily given. Improvement rapidly followed, and on April 26, V., R. = $\frac{20}{20}$ and V., L. = $\frac{20}{20}$, and could read easily with his hyperopic correction.

The *prognosis* is very favorable. Hirschberg's patient was well and the eye entirely normal in eight days. Hutchinson's in two months, and Priestly Smith's in six months after beginning treatment.

CARBON DISULPHIDE. The principal difficulty in setting forth the symptoms of carbon disulphide poisoning, resides in the fact that many of the patients were either smokers or drinkers, or both, and it is a question whether the central scotomata in some of the published instances may not have been due to these agents. When, however, vision was good previous to the bisulphide poisoning, we may properly attribute the amblyopia to the latter chemical.

As in quinine amblyopia, there are doubtless many cases of transitory amblyopia and partial poisoning unrecognized and unpublished. Of the cases investigated by the British Ophthalmological Society (110) in 1885, twenty-four in all, many were smokers. As typical examples of the eye symptoms in carbon bisulphide poisoning, I have abstracted the following cases. The first was published by Mr. Gunn (111) in 1886; the next two are from Hirschberg's (112) (113), Klinik while the fourth was reported by Becker (114):

CASE I. Thomas W., aged 33, worked continually with bisulphide of carbon as stillman in oil works for fourteen years, and was exposed to

bisulphide of carbon fumes for the last five or six years. The chloride of sulphur is also employed in the works. His general health has failed for the last year; has suffered from aching in the ankles and arms, and pain in the muscles, particularly after walking; loss of appetite, pain in the temples, "a feeling of having had a blow on the top of the head." On two or three occasions, some months ago, he completely lost power over his lower limbs. About four months ago his sight began to fail. He has been married for ten years; within the last eight or nine months has noticed a failure of sexual power. He is a moderate drinker, his average being not more than two pints of beer daily. He smokes one and one-half ounces of strong tobacco weekly, his first morning pipe often making him feel sick. *Present condition:* He is nervous, indeed almost hysterical. His gait is normal, and his knee jerks moderate. Pupils wide, act fairly to light. Tn. He can decipher J. xix c. each eye. Red and green blindness completely, detects blue and yellow moderately well. Field of vision for a while good, very slight peripheral contraction. *Ophth.* R. O. D. very pale, large vessels of good size. L. O. D. opaque looking, and somewhat pale, large vessels normal.

CASE II. Worker in rubber factory, aged 16, came January 18, 1886. Had worked a year with CS₂ and SCl. At Christmas, vomiting, sulphur eructations, headache, restlessness at night, wandering in mind. Then visual disturbances; R = fingers at twelve feet, L = seven feet. Field of vision normal at the periphery, but there is a large absolute central scotoma with a radius of twenty degrees. Colors are seen outside. Normal fundus. On February 11, the scotoma is ring-shaped, small, and paracentral. On February 22, V., R. = fingers at fifteen feet; V., L. = fingers at seven feet.

CASE III. A girl, aged 26; worked in a rubber factory, and was exposed from two to three hours daily to the fumes of CS₂ and SCl. V. = $\frac{22}{100}$ U. O. Central scotoma for colors, white doubtful. The fundus was normal, but both maculae were stippled and had the peculiar look noticed in the anemic fundi of animals poisoned by naphthaline. Recovery was slow. In six weeks V. = $\frac{30}{100}$.

CASE IV. Reported by F. Becker: A. G., aged 66, worked in a rubber factory on articles which he was obliged to immerse in a solution of chloride of sulphur in CS₂. First had sweet taste in mouth, loss of appetite, and cramps in the calves of his legs. Then gradual affection of sight. A moderate smoker and drinker. V. = fingers at three meters. Periphery of field uncontracted, but large central scotomata for red, green, blue, and yellow. Temporal half of papilla very pale. In a month V. = $\frac{1}{2}$, but a small scotoma for white remains, and Dr. Becker does not think vision will further improve.

The investigations of the committee (110) appointed by the British Ophthalmological Society, to report upon the subject of bisulphide of carbon amblyopia, led them to believe that it is the inhalation of the vapor, and not the contact of the hands with the chemical that produces the poisonous effects. The earliest symptom, and the most constant one, according to Delpech (15), is severe frontal and temporal pain, as if the head were squeezed in a vise. The workmen attributed this to the smell of the sulphuriz-

ing fluid, and in support of this belief is the significant fact that the only patient of Depech's who had no severe headache was the subject of anosmia. Patient's clothes, breath, skin, and hair have a "rubbery" odor. The *stage of exaltation* (Delpech) presents the following features: Loquacity, vertigo, and a feeling of drunkenness in going into the outside air. Variable spirits and an irritable temper. His appetite is often increased, and he becomes sexually excited. Vision now suffers, he sees objects as through a mist. Hearing is even more frequently affected. Often there is general hyperesthesia. These symptoms are followed by a *stage of depression* when there is anorexia, disturbed sleep, and mental failure. Now there is an anesthesia of the skin, especially of the limbs; cramps, great muscular weakness, impairment of sexual desire, or complete anaphrodisia. Fingers became stiff and numb. Vision is now greatly impaired, fog or mist appearing before the eyes even in broad daylight. Pupils are dilated. The peripheral field is uncontracted, but central negative (and sometimes positive) scotomata are invariably present. Pallor of the disc with indistinctness of its margin often noted.

These symptoms increase in severity as long as the patient is exposed to the poisonous fumes, and finally he loses his memory entirely, and is unable to stand upright.

Of the twenty-four cases reported upon, twenty-two were in men. Their ages varied from 15 to 52, ten being under 25. The *prognosis* is, so far as concerns sight, very fair if the sufferer can entirely give up his deleterious occupation. Of twenty-four cases, eight recorded very good or perfect vision; seven others improved more or less; in five, there was little or no improvement.

A full report by Gallemaerts (115) of a case of amblyopia from carbon disulphide, illustrated by charts of the visual fields, with remarks upon the pathology of the disease, may be found in the *Annales d'Oculistique* for 1890.

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[To be Continued.]

ANNALS OF OPHTHALMOLOGY AND OTOLOGY

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No. 1.

CLINICAL MEMORANDA.

A MOSQUITO BITE IN THE MEMBRANA TYMPANI.

By F. C. Hotz, M. D.,
OF CHICAGO.

ON August 23, a gentleman, aged 40, came to my office to get relief from violent pain in his right ear. On the previous evening, while sitting on the veranda, he felt an insect getting into his ear, and immediately afterwards felt a very sharp stinging pain. He at once poured water into the ear to get the insect out, and its buzzing soon ceased, but the ear continued to ache all night. The inspection revealed on the floor of the meatus, near the membrana tympani, a dead insect which proved to be a mosquito, and the lower half of the anterior portion of the membrana tympani was occupied by a deep red blood blister, evidently

produced by the sting of the insect. The blister was opened, its sanguinolent fluid removed, and a solution of cocaine and boric acid instilled, which gave immediate and permanent relief.

SHORT NOTES OF UNUSUAL CASES.

BY WALTER F. CHAPPELL, M. D., M. R. C. S., ENG.,
OF NEW YORK.

SURGEON TO THE THROAT DEPARTMENT OF THE MANHATTAN EYE AND EAR HOSPITAL.

IN private and hospital practice many cases are met with which differ so much in their etiology, clinical history, and response to treatment, that we are sometimes led to think that we have discovered a new or previously unrecognized condition; on further examination, or as the case progresses, it is usually found that these conditions are only types of diseases already named in our recognized tables of diagnosis. A collection of these very interesting cases have recently been under my observation, and while I am unable to give them all a definite place, they doubtless belong to types of familiar diseases.

Case 1. S. D., aged 23. Six months ago had what she thought was a severe cold in the head, the initial symptoms being chills followed by a temperature of 102° F. Severe pain in the eyeballs, and a tight feeling across the bridge of the nose.

At first the nasal discharge was watery in character, but within twenty-four hours, small white shreddy masses of membrane were blown from both nostrils. At the end of ten days the fever and acute symptoms subsided, and the patient, though weak, resumed her duties. Since this attack the nose has always been troublesome, first one side closing, then the other.

Recurrent attacks of nasal hemorrhage following the discharge of white membranous masses from both nostrils have been of frequent occurrence, and very troublesome.

When examined at the hospital the temperature and pulse were normal, but the patient had a very anemic appearance.

The left nasal fossa contained a white membrane attached to a vascular mass on the septum, about half an inch from the floor of the fossa, at the junction of the middle and posterior third of the septum. A similar membrane covered the posterior end of the inferior turbinated body. The right nasal fossa was packed with sheets of membrane attached to, and covering the turbinated bodies and septum.

Small spots of membrane were also visible on the superior wall of the naso-pharynx. Any attempt at removal of this membrane caused profuse hemorrhage. Three pieces varying in size from one-half to three-fourths of an inch in width, and one-sixteenth of an inch in thickness, were ex-

cised with scissors, and submitted to the pathologist of the hospital for examination. He reported the membrane to be similar in structure to that found in diphtheria, but failed to observe any Klebs-Loeffer bacilli.

Douches of weak solutions of bichloride of mercury, creoline, and peroxide of hydrogen were employed to detach the membrane. Failing to remove any by this means, small portions were clipped off each day with the scissors. After the hemorrhage was arrested, saturated solution of chromic acid was applied. This treatment was continued for two weeks, until the nares were free of all membranous material, although it showed some inclination to return at first. An alkaline spray had been used daily during the treatment. About this time a profuse watery discharge became troublesome, and two weeks after the last piece of membrane had been removed, the interior of the nasal cavities had gradually assumed an edematous appearance, which resulted in what is called "polypoid degeneration" of the entire mucous membrane of the nasal cavities, and perfectly occluded them. Many of the polypi were removed with the snare, and after a prolonged treatment the nose cleared of all this tissue. Four months later when the patient called at the hospital, foul smelling scabs packed both fossæ, which were removed, and the mucous membrane found to be in a dry atrophic condition.

Case 2. C. R., aged 13. Two years ago had an attack of acute rhinitis confined to the left nasal fossa, which was followed in a few days by a yellow mucous discharge containing flakes of white membrane. The acute symptoms lasted about four weeks when they subsided, leaving the left naris occluded, and it has remained so ever since. The right naris has recently been closed at intervals, and several attacks of difficult respiration have awakened the patient at night.

Occasionally a mass would protrude from the left nostril, and after a few days, recede. When seen by me both nares were completely occluded, and the patient was obliged to keep his mouth open, and spoke with a decided nasal tone.

An examination showed a large, white, leathery mass occupying the position of the left inferior turbinated body, and protruding backwards through the left posterior naris into the naso-pharynx. The anterior and posterior extremities of this mass had a cauliflower appearance, and varied in size at different times. The growth was removed in three pieces with a cold wire snare. The attachment was confined to the inferior turbinated region, and seemed to be a degeneration of, or a growth springing from, the mucous membrane covering the inferior turbinated body.

A microscopic examination, made by Dr. E. K. Dunham, proved the growth to be a fibro myxoma. The base, or attachment, was curetted, and the patient left the hospital. Three months later there was no return of the disease, and the covering of the inferior turbinated body appeared healthy.

Case 3. H. McG. In December, 1892, had "la grippe" which took the form of severe coryza with subacute laryngitis. Since then the senses of taste and smell have been much impaired. Ordinary odors produced no impression upon the left nostril, but she was conscious of a very offensive odor being always present in the nose, or using the patient's own words, she always "smelt herself." Heaviness in the frontal region with tightness

between the eyes, and mental hebetude were also complained of. The mucous membrane of the nasal fossa looked pale, dry, and leathery. The anterior end of the left middle turbinated body presented an enlarged strawberry appearance, and completely occluded the left fossa. The enlarged turbinated mass was removed, and proved to be expanded bony tissue. Eight days after the operation the patient was able to taste some food; within six weeks both smell and taste were completely restored.

Case 4. E. B., aged 26. About two years ago had a large abscess in the left tonsil. Since then, has had a slight burning pain in that region, running into the ear and extending to the cutaneous surface of the superior and inferior maxillary region, and down the anterior border of the sternomastoid muscle. After this condition had existed about a year, similar sensations appeared in the left arm and leg, with occasional attacks in the left ovarian region. On rising in the morning the burning pains were very slight, but as the day progressed they increased and reached their height between the hours of one and three p. m. They then gradually subsided. During the attack the left cheek becomes red, and the patient erratic and restless in her manner. At my first examination I found the temperature 100° F., and the pulse 120. Every organ was carefully examined by myself and colleagues without finding any organic trouble or anything to account for her condition. The observations extended over a period of eighteen months, and the temperature was taken every other day during that time, and daily for three months without ever finding it below 99° F. or above 101° F.

Treatment for malaria, rheumatism, and several other conditions which it was suggested might be the cause of this neurotic state was given thorough trial; nothing influenced the attacks or temperature in the slightest degree excepting prolonged rest. This gave temporary relief, but a return to moderate employment renewed the attacks.

Case 5. Mrs. D., aged 66. Although physically strong, comes from a nervous stock, and is of a neurotic temperament. Has always had some throat trouble. When 26 years of age her uvula was amputated. Immediately following the operation a severe attack of difficult respiration came on which the patient called "spasm of the throat." A similar attack followed the use of a probang some years later, and after several nervous shocks she suffered from modified attacks of the old trouble. Mrs. D. came under my care in March, 1893, complaining of a constant desire to clear the throat, and a feeling of fullness at the root of the tongue. The mucous membrane of the pharynx and larynx was found congested, and the circulation sluggish. For several days I sprayed the throat with Dobell's solution without any difficulty. On the eighth day, when about to use the spray, Mrs. D. jumped from my office chair, and clutching her throat, ran into the adjoining room and dropped on the floor. Violent efforts at respiration began and continued for some moments without any effect. The face became pallid, and large drops of perspiration broke out all over her body. Ordinary means failing to provoke inspiration, I touched her forearm with the point of a Pacquelin cautery at a white heat. This produced an immediate inspiratory effort and after several applications of this kind respiration was fully established. Two hours later a burning sensation was felt behind the soft palate and extended to the larynx and trachea. This was accompanied by a hacking cough, and a very restless condition. These

symptoms subsided in about twenty-four hours, with the exception of a stinging sensation in the larynx which continued at intervals for more than a week.

When a Pacquelin cautery is not at hand, Dr. A. H. Smith suggests the use of the closed end of a test tube, heated by a spirit lamp. He has found it a very efficient impromptu counter-irritant.

Although the Klebs-Loeffer bacillus was not observed in my first case, it seems most probable that it was one of nasal diphtheria extending over a period of several months. Membranous rhinitis is said not to continue longer than four weeks at the outside.

The attachment of the membrane, and its efforts at reformation, are characteristic of diphtheretic membrane only.

During the treatment of this case, one of my assistants and myself had several short attacks of pharyngitis. From inquiries made among the patient's friends, I found that many of them had suffered recently from sore throats of more or less severity.

The acute edematous condition of the mucous membrane and its subsequent polypoid degeneration, was a very unusual experience for me, and the present atrophic state is also interesting, being probably due, in part, to traumatism.

The second case is similar to the first in early history, but on comparison it seems most probable that it was one of membranous rhinitis confined to the left naris, followed by a chronic inflammation and subsequent transformation of the mucous membrane of the inferior turbinated body into fibro-myxomatous tissue. When removed, this growth showed no disposition to return.

Anosmia, as in my third case, is not infrequent, as a result of hypertrophies and nasal growth, but the presence of parosmia at the same time, and seemingly due to the same cause, appears to be an uncommon experience, as is also the perfect restoration of the impaired senses after such a combination.

22 East Forty-Second street.

REPORT ON PROGRESS—OPHTHALMOLOGY

ABSTRACTS FROM OPHTHALMOLOGICAL PAPERS APPEARING IN CURRENT AMERICAN AND ENGLISH JOURNALS.

By CHARLES H. MAY, M. D.

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THE EYE AND EAR COLLEGE OF PHYSICIANS AND SURGEONS,
BOSTON; ETC.

INDIRECT MASSAGE OF THE LENS FOR THE ARTIFICIAL RIPENING OF CATARACT.

Dr. Jackson (*N. Y. Med. Jour.*, Oct. 23, 1893,) reports his test of the method suggested by Dr. T. R. Pooley, (*N. Y. Med. Jour.*, Dec. 26, 1885,) in seven cases. The method consists of a preliminary paracentesis of the anterior chamber, and the massage of the lens through the collapsed cornea by the means of a tortoise-shell spatula for one and one-half to two and one-half minutes. He summarizes his conclusions as follows: "It seems more certainly efficient than Förster's. It is almost entirely free from danger. It is probably a better means of avoiding prolonged practical blindness than the extraction of the immature cataract."

EXOPHORIA CURABLE WITHOUT OPERATION—AN ADDITIONAL WORD AS TO THE TREATMENT OF EXOPHORIA.

George M. Gould, A. M., M. D., Philadelphia—*Medical News*, October 14, 1893, and November 18, 1893.

The following represent the essential points in these two very interesting papers on a subject which seems to be occupying more and more space in ophthalmological literature. The writer states: "My experience shows that every case of exophoria, (and possibly of divergent strabismus), is certainly and quickly curable by a rational and common method of ocular gymnastics, and absolutely without operation." After pointing out "the absurdity of cutting a relatively strong, but in reality not over-strong muscle, in order to give its weak counteracting muscle more strength relatively,"

he calls attention to many facts "going to show that, at least primarily, the fault cannot lie wholly, or chiefly, and generally not at all, with the length, strength or weakness of the muscles, *qua* muscles, but it is largely, if not entirely, dependent upon innervation and innervational coördination," * * "I have sought to break up the bad habit of exophorial innervation, to re-establish normality in an erroneous nervous coördination, to heighten convergence-stimulus, and to carry this increased stimulus as well as the naturally heightened stimulus of convergence at near range, into distant and all-round seeing." This method, he calls "the weighted convergence-stimulus, carried from the near point to the distant point." Determining the power of adduction at twenty feet, in a great majority of cases of subnormal adducting power, he finds that the "weighting" or "handicapping" by prisms, bases out, is at first about double the primary twenty foot adduction power; if the patient has only 10° , we may safely give, at first, 20° prisms (total). "Let the patient first fix upon a small bright object or $20/40$ test-letter, held at a distance of twelve inches from the eyes, then slowly carry this object from the near point to the distant point. This is to be repeated until the eyes with 20° prisms can hold objects all about the room easily. The repetition is to continue several times daily until this increased adduction power is *habitual*, and until no diplopia is produced on first adjusting the prisms, and looking at distant objects immediately. When this condition has been reached, the strength of the "handicap prisms" is to be increased say, to 25° or to 30° , and the method resumed as before. Before an adduction power of 30° has been reached, the symptoms of asthenopia will long have vanished. The treatment with 30° or 40° prisms should be continued until all manifest and latent exophoria has disappeared, and 2° of esophoria have become manifest." Regarding the "durability and perpetuation of once-gained normality," he says: "I have been delighted to find how steadily it is maintained. * * I have had no relapses so far, although I frankly confess that my oldest cases cured by this method have been only a few months out of my hands. Their reflex symptoms, however, disappeared before the return of muscular coördination, and subsequent retestings show no tendency to revert to the old disorder."

THE PRESCRIBING OF PRISMS.

Ernest F. Maddox, M. D., Edinburgh—*Ophthalmic Review*, February, 1893.

This instructive paper is well worth careful reading. In it Maddox describes a modification of the rod which bears his name:

"The best form for use is a series of small glass rods about an inch long, arranged parallel to each other, and in close contact. Any one can make this for himself by breaking up a long glass rod about one-eighth of an inch in diameter into short pieces of equal length, laying them side by side on a hard surface to get them perfectly level, and then fixing their ends with sealing wax. The advantage of this form is the ease with which it is held opposite the patient's pupil, for one of the rods must be in front of it."

A NEW PHOROMETER.

A. E. Prince, M. D., Springfield, Illinois—*Archives of Ophthalmology*, July, 1893.

THE BEST FORM OF CYLINDER TEST AND VARIABLE PRISM WITH A NEW PHOROMETER.

Journal of the American Medical Association, November 11, 1893.

THE ROD TEST WITH THE ROTARY VARIABLE PRISM

Edward Jackson, A. M., M. D., Philadelphia—*Ophthalmic Review*, August, 1893.

Both of these instruments consist of a Maddox cylinder combined with a single or double rotary prism. The advantages of these new phorometers are that they possess all the good points of the older instruments, and in addition are simple, inexpensive and delicate to a fraction of a degree. They are fitted into a handle, and require no expensive stand or leveling apparatus.

AN INSTRUMENT FOR THE RHYTHMICAL EXERCISE OF THE OCULAR MUSCLES—THE PHOROTONE.

H. McI. Morton, M. D., Minneapolis—*Medical Record*, October, 14, 1893.

This instrument consists of two sets of superimposed discs provided with prisms so arranged by the power of neutralization that any or all sets of ocular muscles can be exercised at will; the exercised muscles are exposed to one period of action followed by two of repose, the exercise consisting of alternate contractions and relaxations.

ATROPHY OF THE OPTIC NERVE AS A SYMPTOM OF CHRONIC DISEASE OF THE CENTRAL NERVOUS SYSTEM

Thomas Buzzard, M. D., F. R. C. P.—*British Medical Journal*, October 7, 1893.

The writer finds atrophy of the optic nerve most frequently associated with insular or disseminated sclerosis, next frequently in connection with fasciculated sclerosis of the posterior columns (in tabes and general paralysis of the insane), least often with

fasciculated sclerosis of the lateral columns. He found atrophy in forty-three out of one hundred cases of disseminated sclerosis of the posterior columns, thus corresponding with the results obtained by Uhthoff (48 per cent). Visual impairment varied very much, was very often unilateral, and when bilateral, was not symmetrical and rarely terminated in complete blindness. Many cases showed *concentric* diminution of the field both for white and for colors. Such contracted fields should make us hesitate in diagnosing "hysteria" even though there are no appearances of atrophy of the optic nerve, for often in such cases, a change in the nerve which ultimately ended in atrophy, subsequently showed itself.

Among 156 cases of tabes he found fifteen cases of discs with atrophic changes. There is, apparently, no constancy in the character of the visual field in tabes. "Concentric shrinkage is observed, or the limitation may sometimes be temporal, in other cases nasal. Central scotoma would appear to be exceptional." He concludes as follows: "Are not many of the cases of the retro-bulbar neuritis of ophthalmologists really examples of the "hysterical" form of disseminated sclerosis, the type in which, in its early stages, the characteristic symptoms are either entirely absent or but feebly expressed?"

GOUTY RETINITIS, CHORO-RETINITIS AND NEURO-RETINITIS—

Charles Stedman Bull, M. D., New York—From the Report of the
Twenty-Ninth Annual Meeting of the American Ophthalmological Society—*Boston Medical and Surgical Journal*,
November 23, 1893.

The paper was based upon the study of the retinal changes found in over one hundred cases of gouty patients. Five of these cases (two with autopsies) were reported in detail. The points to which attention was drawn were: "1. The changes in the fundus were always bilateral though rarely symmetrical in the two eyes. 2. The degeneration in the walls of the blood vessels and in the retina cause marked impairment of the central vision, little or no impairment of peripheral vision, and never end in blindness. 3. The loss of central vision is always progressive up to a certain point, unless the cause of the disease is recognized early in the outset, and immediately and properly handled. Improvement of the vision after the disease is established cannot be expected. 4. Hemorrhages into the retina are rare except in the beginning of the disease. Their absence later is probably due to the fact that the strength of the vascular wall is increased by the deposit though

its elasticity is diminished. 5. The most marked feature in the fundus is the development of the arterio-sclerosis and the phlebo-sclerosis. This is seen by the ophthalmoscope in the vessels of the retina, and the microscope shows that the degeneration exists as well in the vessels of the choroid and optic nerve. 6. Another almost equally pathognomonic symptom is the peculiar yellowish granular exudation in the retina, located by the ophthalmoscope around the posterior pole of the eye, and generally leaving the macula intact, and proved by the microscope to be mainly in the nerve-fiber layer, though formed in all the layers except that of the rods and cones. 7. The changes in the optic nerve fibers seem to be almost entirely intra-ocular, and cannot be traced for any great distance back of the eyeball."

ABSTRACTS FROM FOREIGN OPHTHALMIC JOURNALS.

BY CASEY A. WOOD, C. M., M. D.

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FACTS RELATIVE TO THE DEVELOPMENT OF MYOPIA, WITH DISCUS-
SION. THE TREATMENT OF CORNEAL ULCERS AND ABSCESES
BY CURETTING AND IRRIGATION, WITH DISCUSSION. ON
ECZEMA OF THE LIDS. THE ACTION OF SCOPOLAMINE
UPON THE EYE; AN ATROPINE SUBSTITUTE. CYAN-
IDE OF MERCURY IN OCULAR THERAPEUTICS,
WITH DISCUSSION. A NEW TREATMENT OF
GLAUCOMA. EXTRACTION OF THE
TRANSPARENT LENS IN HIGH DEGREES
OF MYOPIA, WITH DISCUSSION.

On August 7, 8, and 9, was held the twenty-eighth meeting of the Heidelberg Ophthalmological Society; while, earlier in the year (May 1, 2, 3, and 4), the Eleventh congress of the French Society of Ophthalmology sat in Paris. The transactions¹ of these important societies furnish us with many interesting papers, some of which, in abstract, I desire to present under the heading of this review.

The reading of a paper often elicits discussion of a kind quite as interesting as and sometimes more valuable than the matter contained in the original contribution. I have, consequently, translated as much of these criticisms and additions as I think will be of interest to readers of the ANNALS.

Facts relative to the development of myopia. SULZER. Numerous observations have demonstrated that the prolonged exercise of the eyes at a near point does not necessarily produce short-sightedness. Watchmakers, for example, who are continually using their ocular muscles and straining their eyes while making accommodative and convergent efforts, are not especially myopic.

¹ Bulletins et Mémoires de la Société Française d'Ophtalmologie. Onzième année, 1893.

Bericht über die Versammlung der ophthalmologischen Gesellschaft. Heidelberg, 1893.

In the schools, on the contrary, many examinations have taught us that myopia goes hand in hand with the use of the eyes for near work. I was astonished to find in the schools of Geneva that short sight is, in the beginning, almost without exception, unilateral. If later on, it becomes binocular, the majority of cases continue to show an unequal degree in the two eyes. Scholars and watch-makers maintain different attitudes during their work; the latter place the object directly in front of them so that it is the same distance from each eye; the former, engaged in writing English script, incline the head sometimes to the right, sometimes to the left. This position of the head is due to the tendency of the scholar to give to the basal line a position perpendicular to the inclination of the writing. Thus, 60 per cent of the students aforesaid preferred to hold their heads to the right; 40 per cent incline them to the left. Sixty per cent were found to be more myopic in the left eye than in the right, while 40 per cent were more myopic in the right eye than in the left. It is not possible to explain this as a mere coincidence. It seems to me to permit of but one explanation: it results from an inclination of the head which places the point fixed at unequal distances from the two eyes. To obtain equally distinct images in both eyes, under these conditions, the child must, if necessary, make unequal accommodative effort in each eye. Permit me to cite some figures. In the case of a child whose attitude (which we may call good) during study is such that one eye is 35 cm., and the other 33.5 cm. from the object, the accommodative difference is 0.173 D. In the second or *mediocre* class where the eyes are distant, respectively, 24 and 19.5 cm. from the fixed point, the difference equals 0.97 D., while in the *worst* attitude, 12 and 9.75 cm., 1.87 D.

We now know that unequal accommodative effort in the two eyes is physiologically impossible, and, as shown by the evidence of the schools, the eye further removed from the fixed point relieves its accommodative struggle by becoming elongated.

School myopia then may be considered as the outcome of an adaptation of the visual apparatus to a vicious attitude induced by writing inclined script, an adaption in the interests of binocular vision. *The introduction of perpendicular script will be the most effective prophylactic against the progress of school myopia.*

ROMÉE (of Liège) said, that as opposed to the 25 per cent of myopia found by Mr. Despagne in certain Paris schools, he had found in the common schools of Liège only 0.7 per cent of myopia among the boys and 1.74 per cent among the girls. He had been

able to establish a considerable diminution of the number of myopes as compared with former examinations made during 1881, in the State normal school and the Girl's Orphanage.

He believed the chief cause of myopia to reside, not only in the case of schools but of individuals also, in insufficient illumination. In Liège house-lighting is excellent; the lamps in use are very good, while petroleum, which in Paris costs from 70 to 80 centimes a litre, can be bought in Liège for 11 centimes. He asked whether the principal reason for this great difference in the proportion of myopia in the two countries is not the outcome of differences in the illumination.

MARTIN. The causes which our colleagues have just advanced are doubtless effective in the production of myopia, but they are relatively of minor importance. The question of race, and especially of temperament, seems to dominate all other causes. The use of the eyes for near work brings about in persons of a certain temperament a ciliary spasm which directly produces an axial myopia. My researches allow me to assert that spasm is a constant factor in the production of near-sightedness.

The causes of myopic spasm are such as produces an exaggerated accommodative effort (defective light, vicious positions of the body or head in school, astigmatism, prolonged work), but these causes alone are not sufficient, except in those predisposed to it. Again, such a spasm is likely to follow an ocular traumatism, a keratitis, or some such debilitating disease as typhoid fever, measles, influenza, etc.

In my opinion, prophylactic treatment should consist in augmenting those forces that, generally speaking, resist disease. We make our children begin their studies at too early an age; we allow them too many hours of study and not enough exercise.

VIGNES. *Apropos* of spasm of the accommodation, M. Belliard and M. Dianoux have reported to the Paris Ophthalmological Society some very interesting observations made in Nantes. A large number of young scholars were found to have had accommodative spasm, followed later on by myopia. Following the advice of M. Dianoux, the school illumination was improved, and the spasm of accommodation completely disappeared. These are instructive facts as bearing upon defective lighting as a forerunner, first of accommodative spasm, and finally of axial myopia.

Having myself examined a number of Paris school children I was struck by the large proportion of anisometropes, a fact in accord with M. Sulzer's observations. I trust when we shall have

obtained such reforms in our own Paris schools as M. Romi   has fortunately been able to introduce into the schools of Li  ge, that our statistics will at least resemble his, especially as our race is much less predisposed to myopia than our neighbors.

MOTAIS. I have examined, during eleven years, more than 5,000 pupils from the colleges and schools of West Central France, and I am convinced that myopia is not a question of race. For example, its marked development in Germany means that instruction is more widespread in that country and extends over a longer time. Its production has affected a larger number of generations, and the influence of heredity is consequently the most potent factor.

The treatment of corneal ulcers and abscesses by curetting and irrigation. DEWECKER. I believe that the treatment of corneal ulcers by such methods as the Saemisch section and cauterization will eventually give way to scraping with small and sharp curettes. Snellen, *p  re*, and Badal after having, like myself, followed this plan, are declared partisans of it.

The advantage of scraping lies in the preservation of healthy tissue which would be destroyed by the use of the cautery. The object of this novel procedure consists in the substitution of healthy for infected walls in the ulcer or abscess, which are afterwards preserved in their normal condition and kept from subsequent infection by an appropriate antiseptic treatment.

The details are as follows: we attack the ulcer or ulcerating abscess with our small curette until all the infected tissue has been removed; this is followed by a plentiful, and long-continued irrigation with boric acid solution (4 per cent), finally an antiseptic bandage.

VACHER. For some time past I have been in the habit of using the curette, and following it by irrigation with boiled water. I prefer it to mercurial solutions which produce haziness of the cornea.

DESPAGNET. I consider the curetting of ulcers in general, as a surgical procedure of great value, still I am constrained to ask M. deWecker, in regard to corneal ulcers, what he considers are the precise indications for the operation, and what are its dangers? Because, in operation on such a limited surface, and on such a thin membrane, it seems to me quite possible to exceed the limit of the diseased tissues and to render the situation worse than before the surgical interference.

From the standpoint of their extent I divide corneal ulcers into two classes, superficial and deep.

The first affect only the superficial layers, the epithelium and Bowman's membrane. I do not think M. de Wecker would recommend the scraping treatment for them. Indeed it is practically impossible to measure the penetration of the curette by tenths of a millimeter so as not to injure the true substance of the cornea. When the latter is injured a scar invariably follows. Avoiding this, superficial ulcers undergo repair without any cicatrix.

As to deep ulcers, I can well believe that scraping would modify their course, but again, is there not a real danger of perforating the cornea and so bringing about evil results which we would gladly avoid?

GILLET DE GRANDMONT. In the treatment of these ulcers, there are at least two rational procedures, scraping and irrigation. I will speak of the latter only. Instead of liquids I make use of a gas, oxygen, under a pressure of 150 atmospheres, and this gaseous douche has the important advantage of thoroughly cleansing all the minute cavities and anfractuositities of the ulcer.

GALEZOWSKI. Spreading ulcers of the cornea are always accompanied by an anesthesia of the parts, and for this reason all irritating applications should be avoided. For this purpose I apply a simple dressing entirely covering the affected eye, and, as a complement to this, introduce some antiseptic gelatine discs, renewing the dressing once in twenty-four hours.

VALUDE. As long ago advised by myself, and others, the ocular dressing to be really exclusive (*occlusif*) should be kept continuously in place not for twenty-four hours, but for several days. Consequently, cases treated by M. Galezowski's plan would not receive the full benefits of the treatment by occlusion.

M. DEWECKER, in reply, said that so far he had very rarely entered the anterior chamber and that superficial ulcers healed very rapidly and satisfactorily (as regards cicatrices) after scraping. He congratulated M. Valude on having popularized the occlusion method, and thought that the use of the sharp curette, followed by irrigation and the exclusive dressing, constituted a most complete and excellent method for the treatment of corneal ulceration.

[It seems strange that in the foregoing discussion no reference was made to the value of the aniline dyes in determining the limit and depth of corneal ulcers. It appears to me that in such cases, especially for determining the boundaries of irregular, spreading ulcers, they are indispensable. Without the aid of blue pyoktanin, green fluorescein and some other stains, there is certainly much to

justify M. Despagne's criticism of the scraping (with a *sharp* curette) treatment of all forms of ulcer. With the help, however, of a staining fluid that clearly outlines the affected tissues and reveals their extent, curetting, as many American surgeons have testified, is a very valuable procedure. C. A. W.]

On eczema of the lids. TROUSSEAU. Palpebral eczema is an affection distressing to the patient and discouraging to the surgeon on account of its obstinate character, its successive attacks, and its frequent exacerbations. It is always accompanied by a special form of conjunctivitis, which we may call *conjunctivitis eczematosa*, characterized by an irritating catarrhal secretion, more or less marked, which seems to intensify and aggravate the dermal lesion.

Finding that the latter affection did not yield to milder means, (zinc sulphate, silver nitrate, etc.), I have successfully employed conjunctival irrigation with a non-alcoholic solution of corrosive sublimate, beginning with 0.05 gm. and gradually increasing to 0.25 gm. in 500 gms. of water. I soon found that the march of the cutaneous disease was impeded by the application of warm compresses immersed in the same solution. I have succeeded by this means in curing cases, affected by eczema for a long time, that had received no benefit from a great variety of other methods of treatment. I was led to try this remedy in consequence of my belief in the parasitic nature of the disease.

If the eczematous surface be much irritated one can apply a starch poultice prepared aseptically.

Ointments often do harm and may provoke an extension of the disease. One should never use them except at the end of the attack after desquamation has ceased, and then only with the greatest caution, using such non-irritating excipients as pure vaseline, with bismuth, zinc oxide, ichthyol, yellow oxide, etc. Here, of course, is an opportunity for the display of medical tact.

*The action of scopolamine upon the eye.*² L. BELLARMINOW has made a number of observations upon eyes under the influence of this new mydriatic, lately introduced by Raehlmann. These experiments were made upon both healthy and diseased eyes, with the following conclusions: scopolamine is, generally speaking, indicated in cases where one would employ atropine, and especially for the determination of refractive error and accommodative anomalies in those cases where a rapid and complete paresis of the

² *De l'action de la scopolamine sur l'oeil.* Revue générale d'ophtalmologie. No. 7, 1893. From the Russian (Wratch No. 17, 1893) by M. Chodin

ciliary muscle is required. The period of cycloplegia and mydriasis is considerably shorter than when atropia is employed. The new drug is to be preferred to atropine in the milder forms of corneal inflammation, and in general, where the morbid condition is likely to disappear before the disagreeable effects of atropine pass off. The scopolamine seems to possess all the good qualities, and lacks many of the bad qualities of atropine. For these reasons the writer believes that it will, in time, displace atropine in the practice of the oculist.

Cyanide of mercury in ocular therapeutics. SCHLÖSSER. Following Chibret, I have studied, during the past year, the curative and other effects of potassic cyanide, especially in comparison with mercuric chloride, and I believe that the irritation set up in the eye by the latter is about four times as great as when the cyanide is employed. Potassic cyanide does not, to any extent, coagulate albumen which, as every one knows, is abundantly precipitated by corrosive sublimate. Finally, instruments are unaffected by the cyanide.

Clinically, I have also had experience of the remedy, especially in infective conditions. I have applied to the everted lids a 2 per cent solution in cases of acute conjunctivitis with a rapid decrease of the secretion.

In thirty-seven cases of purulent dacryocystitis, acute and chronic, irrigation with the same solution has given good results. Three patients with chronic blennorrhœa of the sac have been cured in this way, and for nine months there has been no appearance of a return of the disease.

SEGGER. I have had a similar experience with the oxycyanide of mercury, and I have observed that in conjunctival inflammation the purulent secretion has rapidly disappeared under its use in solutions which, by the way, need not be very strong.

A new treatment of glaucoma. KNIES. I have succeeded in diminishing the liability to accident in operations for glaucoma by making my corneal incision very peripheral so as to include the iris in the section. This *iridosclerotomy* is of especial value in the acute forms of glaucoma. Thus the danger of hernia of the iris—an accident that not infrequently follows the ordinary sclerotomy—is very much reduced. The operation is indicated in all cases of glaucoma where iridectomy would be of value.

Extraction of the transparent lens in high degrees of myopia. FUKALA. [Some years ago I translated for the *American Journal of Ophthalmology*,³ Fukala's original paper on this subject.⁴ I would

refer my readers to this article for necessary details. I also reported a few cases where, for its optical effect, the operation was done by my late partner, Dr. W. F. Smith, and myself. Since that time I have been able to repeat the operation with gratifying results, and although my experience has been limited, I would recommend Fukala's operation in suitable cases and especially in young subjects. The criticisms by other members of the Heidelberg Society of Prof. Fukala's paper, given here, will show how the innovation is regarded in Europe where opportunities for its employment occurs more frequently than in this country. C. A. W.]

It is necessary, in considering the operative treatment of myopia, to determine whether a patient having an excessive amount of nearsightedness, retains and can maintain with it good and useful visual acuity, or whether the conditions are such as to render it impossible for him to do effective work. For, only in the latter case, should the operation be performed to enable the sufferer to gain a livelihood. The operation should only be undertaken in adults who have at least 14 or 15 D. of M. Children having as little as 10 D. may be operated upon, since in these cases the myopia will probably increase. In myopia above 14 to 18 D. only one lens should be removed; in myopia above 18 D., both lenses.

The visual acuity improves from twice to four times that which the eye possessed before the operation. In one case where M. = 20 D. vision was $\frac{1}{30}$ before and $\frac{1}{2}$ after the removal of the crystalline. Finally, the refraction has remained without change, or, at least, has done so in my cases up to date. In persons whose single eye has been operated upon the refraction continued unchanged in that eye, while in the other eye the myopia had increased. Up to the present time my experience includes thirty-seven cases and I have not had a single mishap.

VON HIPPEL. I have operated upon several subjects affected by high myopia: a young workman with 18 D. and a low visual acuity; a young girl, myopic 16 D.; a child, aged 7, with 20 D. There was no inflammatory reaction, and several days after the discission I removed the soft cataractous masses. I did not do an iridectomy. I have not noticed any increase of visual acuity, the myopia is simply reduced (according to Fukala 16 D.—Trans.) by the removal of the lens or transformed into a greater or less

³ November, 1890, Vol. VII, page 347.

⁴ *Operative Behandlung der hochstgradigen Myopie durch Aphakie. Graefe's Archiv für Ophthalmologie*, Bd. XXXVI, 2.

degree of hypermetropia. I feel certain that it is quite safe to operate in spite of the presence of choroiditis, but I am unable to decide whether the progress of the myopia is retarded by the extraction of the lens.

FUKALA. It is necessary to wait sometime after the operation to allow the visual acuity to re-establish itself. I believe that children, even those with as high a degree of myopia as 15 D., are eventually able to accommodate.

THIER. I am able to speak, in this connection, of five patients who underwent nine operations with good results, except in the case of a man, aged 40, whose visual acuity was only temporarily improved. All the others were permanently benefited.

In one myope of 13 D. the refraction was transformed into hypermetropia of 3.5 D. and had vision of $\frac{3}{30}$ improved to $\frac{5}{8}$. This was an engineer who, after operation, was able to resume his occupation.

A young governess, who found herself obliged to give up her work, was subsequently able to resume teaching. A young workman with M. of 18 D. had his vision raised from $\frac{5}{80}$ to $\frac{5}{30}$ to $\frac{5}{10}$.

I practice discission without iridectomy, removing the softened masses in from three to thirty days after the needling.

SIEGRIST. I have been able to observe the patients operated upon by Pflueger, who has extracted the transparent crystalline twenty-seven times, and I did not notice the increased acuity of vision claimed to set in immediately after the operation. The patients are generally satisfied with the results.

In all the cases, except two, the extraction was done in one eye only. An increase of visual acuity was always noticed in every case, but it did not show itself until several months had passed.

The operation consists in discission, followed by repeated corneal punctures, for the expulsion of soft lenticular masses. Several months afterwards the patient returns for discission of the secondary cataract, subsequent to which existing refractive errors, especially astigmatism, are corrected.

VALUDE, I have done this operation twice under the following circumstances: The first patient was a child about 10 years of age (I reported this case last year) who, having a myopia of from 16 to 18 D., could not continue his studies or learn any sort of trade. I removed both lenses by different methods, and without iridectomy, at an interval of fifteen days. On one side I employed discission with a subsequent evacuation of the lenticular masses but in the other eye I did the ordinary extraction operation, fol-

lowing it by a discission for secondary cataract. The immediate results, objective and optical, were perfect in both eyes and lasted several months. At the end of that time, however, the eye upon which the simple extraction had been done became affected by retinal detachment. The disease increased, became total, and terminated in atrophy of the globe.

I saw this child within the last few weeks, (the operation was done two years and a half ago), and found the following conditions present: the eye treated by discission, hitherto in good condition, has now blurred vision. I was able to discover at the periphery of the retina a peculiar cloudy appearance, indicative of detachment. There was no change in the refraction.

My second patient is a man about 40 years of age who has a progressive myopia of 18 D. In consequence of this affliction he was no longer able to work and came to me for a certificate that would admit him to hospital. I wished to help this unfortunate, still healthy and in the prime of life, so I did a discission, followed by evacuation, on both eyes at an interval of two weeks. This time I combined the treatment with iridectomy. The result was very good, the man was able to work and to read, and that happy state of affairs has continued for a year.

Here, then, we have two cases, essentially different. In my judgment, Fukala is right in defending a procedure that will rescue certain myopes from misery and semi-blindness. I believe with him that the operation should be reserved for cases of absolute necessity. To the dangers which attend it, as illustrated by my first case, we are not justified in exposing myopes who possess a measurable degree of useful vision.

RAEHLMANN. I consider it dangerous to operate on myopes with disease of the fundus. Variation of the intra-ocular pressure in such cases is extremely dangerous.

FUKALA. The improvement in the visual acuity being mainly due to the displacement forward of the nodal point we shall have a good result if the operation has been uncomplicated and the choroidal changes are not serious.

HORSTMANN. I operated five months ago upon two young patients whose condition appeared to me to justify surgical interference. The result is subjectively satisfactory, and vision is improved.

I did a simple discission, and allowed the crystalline masses to undergo spontaneous absorption.

THIER. I have always found better results from operating on

children than on adults, but I advise in all cases that both eyes be treated. I do not attach much importance to increasing the intra-ocular tension, since I have never seen it last, even in a case where absorption occupied thirty-three days.

SIEGRIST. I have myself noticed plus tension in these cases, but a single instillation of atropine was sufficient to relieve it. My chief, Prof. Pflueger, operates only on patients under 40 years of age who present no choroidal complications.

OTOLOGY.

ABSTRACTS FROM FOREIGN OTOLOGICAL CURRENT LITERATURE.

By T. MELVILLE HARDIE, B. A., M. D.,
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SCHOOL; PROFESSOR OF OTOTOLOGY, COLLEGE OF PHYSICIANS AND
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AMONG the interesting subjects discussed by Grunert¹ are the site of predilection for caries in the middle ear, based upon the observation of cases operated upon by the Stacke method in the Halle clinic. The importance of the attic has always been recognized, while caries of the floor has received heretofore but slight attention, although *a priori* we would expect caries of that part of the middle ear to which the pus gravitates. A second place is the *aditus ad antrum*, particularly its lateral wall (twice only in one hundred cases was the median wall attacked). Caries of the promontory is almost invariably superficial, exfoliation of portions of the cochlea was observed only twice. The facial nerve was exposed through caries of the wall of the Fallopian canal several times, and always where the nerve makes its last downward turn. Once the silver tube could be introduced into the canal opened by caries, and in this case the paralysis which existed before the operation disappeared immediately. The simple smooth, paper-like variety of cholesteatoma was more frequent than the large cholesteatomatous tumor. The process, of whatever sort, was almost

¹ Grunert. Stacke's operationsmethode zur Freilegung der Mittelohrräume während des zweiten Jahres ihrer Anwendung in der Kgl. Ohrenklinik zu Hall a. S.

never limited to the attic, but was repeated in the antrum. In one case the outer semi-circular canal presented a fistula, from which pus came. It is noteworthy that here the patient's ability to retain his equilibrium was not affected.

A case of particular interest, as showing that middle ear processes may be cured, while at the same time a purulent inflammation may be extending from the antrum, is related. When the obstructing polypi were removed by the snare it was seen that they had broken through the posterior wall of the external meatus from the antrum, and that the antrum was the source of the pus which appeared in the external meatus. The membrana tympani presented a scar, showed no evidence of existing inflammation, and inflation with the Eustachian catheter gave a normal sound. Whispering was heard at five meters.

The operation confined to the opening of the attic alone is no longer done in Halle, because, as was shown by all the cases in which the mastoid antrum was also opened, the process was practically the same there. To the neglect to open the antrum *with* the middle ear, Grunert attributes the failures which have occurred. In the two cases so operated upon, and remaining cured, he suggests that a simple hammer and anvil extraction might have answered. The usual procedure in the radical operation—a preliminary opening with the chisel, the introduction of a probe through the editus into the middle ear, and the removal of wedge-like pieces of the posterior wall of the bony meatus—was modified only when the sinus transversus was situated so far forward that it was impossible to penetrate the antrum between the sinus and the posterior wall of the meatus, and in the second place, when the antrum was the seat of the trouble, the process in the middle ear having healed. When the sinus was placed so far forward, the antrum was opened from within by the removal of concentric lamellæ from the posterior wall of the meatus. (In one case the lamellæ of bone separating sinus from canal was scarcely 2 mm. thick). In the cases in which healing had taken place in the middle ear, that was left undisturbed, while the rest of the operation was done as usual.

The large cavity is to be carefully cleansed of bone particles, and projecting angles smoothed, in order that the after treatment and the covering of the cavity with epidermis may be facilitated. The two flaps made from the posterior wall of the meatus were repeatedly used to cover the sinus transversus, or dura mater. They were shaped accordingly. In the after treatment necrosis of

the cortical portion from which the periosteum had been removed was usually prevented by drawing back again the periosteum or the temporalis muscle which had been pushed out of the way, and fixing them in place with a few stitches. The greatest hindrance to the extension of the epidermis covering over the operation cavity, were, in the first place, the sharp angles left in the cavity, and secondly, callous thickening of the margin of the epidermis. The means of avoiding the first of these has been mentioned already. The skin margins are cauterized with nitrate of silver, or the galvano-cautery. Grunert prefers the latter, both for this purpose, and when treating granulations as well.

Of great importance is the gauze tampon, which is, in the early treatment, tightly packed into the cavity. Later, usually in the eleventh or twelfth week, the covering with epidermis will proceed much more rapidly if the tampon is more loosely inserted. Aristol, as a mechanical protection for the new epidermis, is praised. Fissures in the meatus wall are best avoided by careful extraction of the tampons. A tendency to eczema of the new covering is corrected ordinarily by a single application of a one per cent solution of nitrate of silver. The average duration of the treatment was four and a half months.

Of the one hundred cases of which records have been published by Grunert and Panse, fifty-eight have been cured.

By reason of the increasing attention which the stapes is receiving at the present time, it has been thought advisable to report at greater length Bezold's case, which was briefly mentioned in the last number of the *ANNALS*.

Removal of the Stapes. Bezold, (Munich), *Zeitschr. f. Ohrenheilk.*, XXIV, 4, October, 1893.

Mrs. C. K., aged 48. Impairment of hearing in both ears for many years. Constant tinnitus for one year. On both sides evidences of suppurative disease of middle ear, with persisting perforations. No discharge at present. Extraction of stapes on right (poorer) side, under cocaine anesthesia. Hearing distance before operation, whispering 2 cm., conversational voice 20 cm. After hooks of various sorts were unsuccessfully tried, the stapes was removed with fine dressing forceps. No flow of serum followed, but at the moment of extraction the patient sank with a sigh on the left side, became colorless, and broke into a perspiration. No loss of consciousness. Immediate test of hearing appeared to show improvement. Great vertigo on attempting to stand. Vomiting on arrival home. Marked dizziness lasted until

the third day. Bloody serum on the cotton in the meatus. Hearing test: whispering not heard at all in the right ear, conversational speech uncertain. Ear remains dry. Dizziness ceased in the third week when hearing test was: whispering speech not heard, conversation directly at ear. The last examination made in the tenth week, conversation speech heard at 3 cm. The result, therefore, of the operation was total deafness for voice tests in the days immediately following the operation, with a gradual improvement from third to tenth week, at which time, however, it was much less than before operation.

Bezold attributes the improvement to increase of pressure on the membrane closing the oval window; in this case, perhaps due to thickening and ossification of the cartilage existing there. He is confirmed in his opinion by having noticed that the artificial drum-head, made of absorbent cotton, improves the hearing only when pressed on the region of the stapes.

* * * * *

Excision of the drumhead and ossicles; the present state of the question. Gomperz, (Vienna). Monatsschrift f. Ohrenheilk., etc., September, 1893.

Gomperz concludes: 1. The results as regard cure in otitis med. purulenta chronica are quite as favorable under conservative treatment as under operative.

2. Excision of the hammer and ambos should not be undertaken when less serious methods of treatment are competent to bring about healing.

After brief consideration of the mobilization, etc., of the stapes, the author discusses at great length the much-written-about extraction of that ossicle. References are made to the cases of Kessel,¹ Clark,² Berthold,³ Wolf,⁴ Ludewig,⁵ Jack,⁶ Schwartz,⁷ Bezold,⁸ Lemcke,⁹ and Stacke.¹⁰ with the greater number of which the readers of the ANNALS are familiar. As confirmation of Jack's statement in his second paper, that the best results were

¹ Kessel. Archiv. f. Ohrenheilk., XI, p. 199; XIII, p. 85.

² Clark. Zeitschrift f. Ohrenheilk., XXII, 41.

³ Berthold. Ibid, XIX, 1.

⁴ Wolf. Versamml. d. deutschen otolog. Gesellschaft Mai, 1893.

⁵ Ludewig. Archiv. f. Ohrenheilk., XXIX, p. 260.

⁶ Jack. Transaction Am. Otol. Society, July 19, 1892; Boston Medical and Surgical Journal, January 5, 1893.

⁷ Schwartz. Handbuch, II, 776.

⁸ Bezold. Versamml. d. deutschen otolog. Gesellschaft Mai, 1893.

⁹ Lemcke. Ibid.

¹⁰ Stacke. Ibid.

obtained in those cases in which the stapes was completely removed; he refers to two cases of his own in which the hearing ability was markedly increased (from 50 cm. to 7 meters, and from 70 cm. to 7 meters for conversational speech) by the formation, apparently, of an artificial temporary membrane of boric acid over the region of the fenestra ovalis.

His conclusions are that the results of this operation can not be predicted, and that it should be undertaken only when this fact is made clear to patients in whom the hearing cannot be improved, nor the subjective noises lessened in any other way.

A CASE OF HEMORRHAGE FROM THE EAR IN A BOY WITH IMPERFORATE DRUMHEADS.

STEIN. (Moscow), *Zeitschr. f. Ohrenheilk.*, XXIV, 4. After referring to the four previously reported cases of Ferreri,¹¹ Stepanow,¹² Eitelberg,¹³ and Gradenigo,¹⁴ the writer relates that of his patient.

Boy, aged 13, was suddenly seized with a profuse bilateral hemorrhage which lasted for three hours, soaking two handkerchiefs. For the past three years the boy had suffered from megrim, especially after severe exercise in gymnasium, more recently epistaxis. The hemorrhages from the ear lasted for four days, becoming gradually smaller in amount. The hearing and drumhead were always normal. The blood appeared to come from the openings of the duct of the ceruminal glands.

Stein arrives at the following conclusions:

1. Hemorrhages from the ear with intact meatus occur not only in women (hysterical), but also in men.
2. Hemorrhages, from the ear, vicarious in character, are observed after cessation of habitual bleeding, not only from sexual organs, but from nose as well.
3. The blood oozes from the excretory ducts of the ceruminal glands.

¹¹ Ferreri. Ref. Archiv. f. Ohrenheilk., XIV, p. 173.

¹² Stepanow. Mitth. f. Ohrenheilk., No. 11, 1885.

¹³ Eitelberg. Internat. Klin. Rundschau, No. 3 and 4.

¹⁴ Gradenigo. Archiv. f. Ohrenheilk., XXVIII, p. 82, 1889.

ABSTRACTS FROM ENGLISH AND AMERICAN CURRENT OTOLOGICAL LITERATURE.

BY LEONARD A. DESSAR, M. D.
OF NEW YORK.

FIFTY MASTOID OPERATIONS.

Dr. B. Alexander Randall (*Medical Age*, Oct. 15, 1893), thinks that the four years of epidemic influenza have greatly influenced the matter of mastoid inflammations, and enforced more frequent resort to operative intervention. Reports of such cases have multiplied during this period, and the author's operations, previously infrequent, rose to seven in 1889, ten in 1890, fifteen in 1891, and twenty in 1892. Yet the finding of past years, that about four per cent of his cases presented evidences of mastoid inflammation and about one-fourth of these demanded operation, has not been verified this year. On the ground of two hundred cases in which evidences of mastoid trouble existed, he believes that three-fourths of these cases can be brought safely through without resort to operation; and that unless the symptoms are urgent or the fluctuation unmistakable, the surgeon can give a fair trial to vigorous use of heat by douche and hot water bottles with rest in bed and good hygiene. When pus is present in or on the mastoid, however, there can be little cause for delay in evacuating it. In only one of his cases was death directly attributable to the operation.

QUININE IN DISEASES OF THE EAR.

Dr. W. Cheatham, (*Cincinnati Lancet-Clinic*, Dec. 16, 1893), states that quinine corrects tinnitus and vertigo when dependent upon debility and anæmia. It is also indicated in cases of Menier's symptoms, and in some cases of suppuration of the middle ear may be an absolute necessity, as is shown by the author's experience. He believes that in cases of quinine-deafness other factors entered, and doubts the possibility of quinine, administered in the usual doses, producing deafness, where is no other complication or an idiosyncrasy.

BENEFIT TO EAR PATIENTS FROM NASAL TREATMENT.

Dr. H. Gradle (*Jour. of the Amer. Med. Ass'n*), concludes that acute catarrh of the middle ear will generally terminate in

complete recovery under aural treatment, and sometimes even without it, provided there are no persistent nasal or pharyngeal lesions. When the latter are present, however, the disease is more likely to become chronic in spite of aural treatment, and cannot be cured or improved for any length of time unless the nose and throat are restored to a normal condition. Proliferating or adhesive disease of the middle ear is considered by the author as the consequence of retro-nasal catarrh. He regards aural treatment alone as practically useless in this form of trouble, while if nasal treatment is successful as regards the catarrh it will also cure the ear disease. The restitution of hearing, however, depends on the length of time the disease has lasted, and is often aided by ear treatment after the cure of the retro-nasal catarrh.

THE CLASS OF CASES IN WHICH WE MAY EXPECT GOOD
RESULTS FROM EXCISION OF THE MEMBRANA
TYMPANI AND OSSICLES.

Dr. S. M. Smith (*Therapeutic Gazette*, July 15, 1893), has obtained excellent results from operative treatment in 154 cases of middle ear disease. The procedures employed consisted chiefly in removal of the membrana tympani and ossicles. They were resorted to sixty-nine times in cases of non-suppurative disease of the middle ear for the relief of marked impairment of hearing, distressing tinnitus, or vertigo. In cases of suppurative disease the discharge was frequently arrested by the extraction of fragments of the membrana tympani and necrotic ossicles, and by establishing free drainage. The author lays stress upon the point that no operation in the entire range of surgery, if carefully performed, is attended with so little disturbance, either local or constitutional, as excision of the membrana tympani, malleus and incus, when not complicated with necrosis of the tympanum.

THE SURGICAL TREATMENT OF CHRONIC TYMPANIC VERTIGO
OFTEN MISCALLED MENIERE'S DISEASE.

Dr. Burnett, (*Medical News*, Sept. 30, 1893), says that tympanic vertigo, due to lesions of the middle ear is of frequent occurrence. It is often recognized by the general practitioner as aural vertigo. It is not unusual for tympanic vertigo to be attributed to intestinal disturbance, or to "neurasthenia" instead of to an aural lesion. True tympanic vertigo, due to a lesion in the middle ear, chiefly from chronic catarrh of the tympanic cavity, is paroxysmal in

character, and attended with tinnitus and deafness in the affected ear. It is caused by the inward pressure exerted in the labyrinthine fluid by the retracted and ankylosed ossicles. The foot plate is thus unduly pressed into the oval window, and there held by the force made, paroxysmally, and for a longer or shorter period.

The author regards morbid pressure due to an impacted stapes upon fluid in the labyrinth as a local cause of vertigo. In a case of chronic middle ear catarrh attended with constant tinnitus, repeated attacks of vertigo and deafness of two years duration, he obtained a favorable result by liberating the impacted stapes by removing the adherent malleus and the membrana tympani. His experience in subsequent cases, however, demonstrated that removal of the incus alone, or of the incus and stapes, the membrana tympani and malleus remaining in position, would liberate the stapes and the compressed labyrinthine fluid, as well as, or perhaps better, than total excision of the membrana and malleus, with less liability to inflammatory action.

On the ground of ten operations, inclusive of resection of the long process of the incus, Burnett concludes:

1. That removal of the retractive force of the sound conductors upon the stapes is the efficient means of relieving the tinnitus, deafness and vertigo due to the lesions of chronic catarrh of the middle ear.
2. That the removal of the retractive force upon the stapes can be accomplished efficiently and simply by removal of the incus alone, and even by resection of its long process.
3. That the improvement in these cases is due to the liberation of the stapes from the retractive power of the tensor tympani muscle and the consequent unimpeded action of the stapedius muscle, which, relieved from the antagonism of the tensor tympani, tends all the more to draw the stapes from the oval window, thus aiding in its isolation and improved mobility as well as removing the undue pressure inward upon the labyrinthine fluid.
4. It would seem wiser, therefore, in most cases of chronic catarrhal deafness, tinnitus and vertigo, not to sever the stapedius tendon and remove the stapes, but to be content with the removal of the incus only.
5. The progressive improvement in hearing noted in many instances must be due to the passive motion exerted upon the ankylosed stapes by sound waves which are enabled to reach this bone more freely after the removal of the incus.

RHINOLOGY AND LARYNGOLOGY.

ABSTRACTS FROM CURRENT LARYNGOLOGICAL
AND RHINOLOGICAL LITERATURE.

BY M. D. LEDERMAN, M. D.,
OF NEW YORK.

THE NASAL REFLEX IN CHLOROFORM SYNCOPE.

M. Guérin, (*Glasgow Medical Journal*, Vol. 40, No. 4), remarked before the French Academy of Medicine, that inhalations of chloroform by the nose were much more dangerous than similar inhalations by the mouth. The irritation of the pituitary mucous membrane could produce a fatal syncope by reflex action. A tracheotomized rabbit was shown, "to whose throat there was applied an apparatus for registering the beats of the heart. As long as the chloroform was administered by way of the tracheal canula, the cardiac contractions went on unaltered; but when the anesthetic was inhaled by the nose, they became feeble, slow and irregular. Where the anesthesia was already deep, nasal respiration had much less effect than at the commencement." M. LeFort reported a case of a child which was being operated upon for syndactyly. The young one was breathing in the chloroform very slowly, and was told to breathe more rapidly. Instead of taking a deep breath, it made a long, forcible snuffle and immediately died. Artificial respiration, insufflation by mouth to mouth and tracheotomy were of no use, death having taken place by syncope.

RHINOLITHS.

Cozzolini (*Amer. Jour. of the Med. Sciences*, Vol. 107, No. 1), reported two cases. In one, the rhinolith had produced a partial destruction of the nasal septum, creating a perforation and appearing in the other chamber. This is supposed to be the only case of its kind on record, excepting the one found on the cadaver by Zuckerkandl. In the other case, two rhinoliths occupied the same fossa. The author differentiates between a true and false rhinolith. In the former the calcareous deposit becomes formed around a nucleus of mucus or of blood, while in the latter, which is the more common, a foreign body such as a cherry stone, a bead, or extraneous matter, forms the nucleus. The true rhinolith is rarely found before the fortieth year of life, and the false one at any time,

the foreign element usually being introduced early in life. For their removal, Cozzolini recommends the bent probes. They are to be introduced behind the body, so as to drag it forward. The forceps usually push it further into the nasal chamber.

TUBERCULOMA OF THE NASAL MUCOUS MEMBRANE.

PROF. DR. O. CHIARI, Wien, (*Archiv. fur Laryn. et Rhinol.*, Vol. 1, No. 2), in an interesting paper upon these rare manifestations of a tubercular diathesis, the author mentions other cases which have been recorded up to the present time. Together with the six cases he reports the total number of tubercular tumors carefully described as twenty-one. In eleven of these cases the bacilli was found. In six instances the diagnosis was made histologically, and in four, by the clinical aspect. The rarity of these growths is apparent, when we learn that only six tuberculoma were found by Schäffer in 450 cases of nasal tumors, and Prof. Chiari's six cases were discovered in a yearly practice of 1500 throat patients for over four years.

In nine instances the tumors were found in males, and twelve times in females. Three patients were respectively 7, 9 and 12 years of age, while one was 16 years old. Under 30 years, five cases were noticed, and the rest appeared in individuals beyond that period to 63 years. In thirteen cases no signs of tuberculosis were found in the lungs, but in seven individuals the disease was either hereditary, or the patients were scrofulous.

In eighteen instances the cartilaginous septum was the part infected, either by the sputum of the patient or by finger nails which carried the bacilli. In appearance the growths were nodular, of a red color, soft in consistency and covered with muco-pus or crust formation. Usually they were confluent, but occasionally they were observed isolated.

The patients complained of a continued discharge, with expulsion of scabs, epistaxis, and finally nasal occlusion. Pain was absent. The growths were removed by the galvano-cautery and cold snares, or with the sharp spoon. The latter method generally excited considerable hemorrhage, which at times could only be stopped by tampons.

Even with the possibility of a return of the disease, the author thinks the prognosis is fairly good. Out of the twenty-one cases mentioned, four became the victims of pulmonary tuberculosis. This local form of the disease does not seem to develop a general miliary tuberculosis.

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